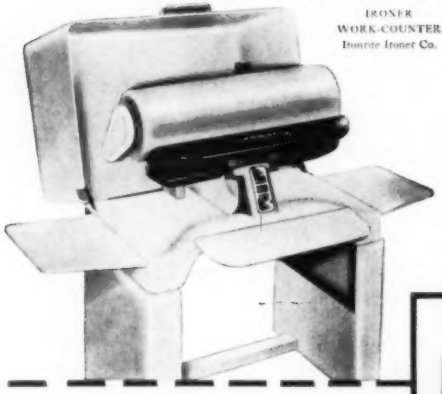
MODERN PLASTICS

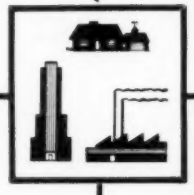
NOVEMBER 1951

When you underline LONG, HARD SERVICE

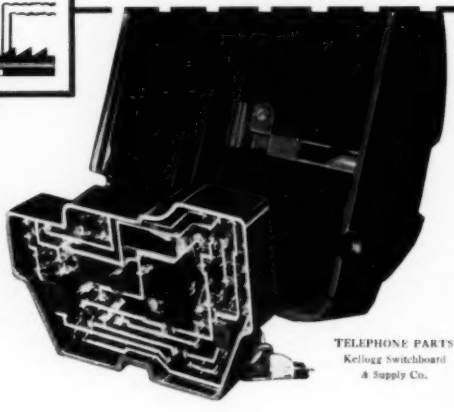


IRONER
WORK-COUNTER
Ironrite Ironer Co.

BEVEL GEAR FOR TEXTILE MACHINERY
Industrial Rayon Corp.



CHAIN DRIVE COUPLING COVER
Morse Chain Co.



TELEPHONE PARTS
Kellogg Switchboard & Supply Co.

. . . here's why custom molders suggest DUREZ

This is an invitation to consider using plastics for applications you may have thought of as being too tough for these materials.

If the products or components you make must withstand the destructive effect of impact, tortion, heat, cold, grease, oil, acids, alkalies, or electrical current, Durez phenolics should fit profitably into your plans. These characteristics are available in outstanding degree among the more than 300 Durez molding compounds.

We have developed phenolic compounds that extend the economies of the molding process into many fields of manufacture for rugged service. Economies measurable in faster production, in elimination of machining, assembly, and finishing operations, and in reduced rejection rates, are being won without sacrificing performance.

It will pay you to talk with a custom molder regularly before product plans become "set." He will bring engineering background, modern production facilities, and knowledge of plastics to your problems. For further information and technical assistance, our field staff is at your service.

Our monthly "Durez Plastics News" will keep you informed on industry's uses of Durez. Write, on office letterhead, to Durez Plastics & Chemicals, Inc., 1211 Walck Road, North Tonawanda, N. Y.

PHENOLIC PLASTICS THAT FIT THE JOB

So that those of us who "take things into our own hands" can finish a surface without finishing our fingers—
BEHR-MANNING comes up with this unique SANDER★
MOLDED OF
Catalin STYRENE
Here's a surface smoother that's also a finger soother! It's strong, lightweight, colorfully attractive CATALIN STYRENE chassis is designed to comfortably fit the palm. It provides a firm, working grip, keeps the hand safely elevated, prevents knuckle cramp. Clever, too, is the camera method for loading and feeding the abrasive strip. It unwinds from the reserve roll concealed within the plastic cavity; the working surface being securely gripped at both ends of the frame by means of a wire guard and magazine clamp. Pretty smooth!... Yes, and very gratifying to know that low-cost CATALIN STYRENE enabled the molder and manufacturer to successfully introduce this popular tool at a popular price!
CATALIN CORPORATION OF AMERICA
ONE PARK AVENUE • NEW YORK 16, N. Y.
★ Custom molded by
Waterbury Companies, Inc.
Waterbury, Conn.

MODERN PLASTICS*

VOLUME 29 NOVEMBER 1951 NUMBER 3

CONTENTS

MODERN PLASTICS BULLETIN

A Special News Service ..... Facing p. 73

GENERAL SECTION

The New S.P.I. Marketing Committee (Editorial) 5

The Tableware War 73
Refutation of attacks made by the Vitrified China Association on the public health aspects of melamine tableware

Drugs Packaged in Plastics 77
A wide variety, large volume market for plastics is seen in packages for physicians' samples

Toiletries Dramatized 78
Max Factor's new line of grooming preparations for men is keyed to designs for plastics

Rails Rest on Polyester-Glass 80
New reinforced plastic replaces steel with improvement in many physical characteristics

Multi-Cavities for Big Machines? 82
The economics of using big injection machines to produce small pieces in quantity

Tough Tote Tray 85
Molded of high impact phenolic, industrial trays stand up under rough treatment

Signs That Stick 86
Vinyl plastisol signs, printed in almost any color range, are easily put up, easily removed

Plastics in Harp Provide Tone Insurance 88
Nylon strings and a reinforced plastic shell make new Irish harp resistant to temperature changes and to moisture

Model Arm Has Vinyl "Skin" 89
Conceived for training in use of hypodermic needle, plastic offers realistic resistance to penetration

Seawater to Drink 90
Rigid and flexible vinyl sheet as well as molded vinyl are used in emergency desalting unit

Plastics Products 92
New and ingenious applications of plastics in consumer products

Glass-Plastic Safety Window 166

Butyrate Rake 168

Transparent Engine in Toy Car 171

New Resins Plant in South 172

Encyclopedia Addenda 174

Polyethylene Dispensing Tube 176

T.V. Tube Spool 179

PLASTICS ENGINEERING

Seams Sealed in Seconds 97
How high quality raincoats are made on equipment engineered for mass production

Large Laminate Cylinders 106
by C. W. Wilson
As power transformers increase in size, larger and stronger insulating cylinders are demanded

TECHNICAL SECTION

Sodium Cellulose Sulfate 109
by George P. Touey
Films prepared from solutions of this salt are colorless, strong, flexible, and oil resistant

Improvement of Wet Strength of Reinforced Plastics by Garan Finish 116
by Robert Steinman
Treatment of glass cloth results in little or no loss of mechanical strength when wet

DEPARTMENTS

U. S. Plastics Patents 120

Plastics Digest 130

New Machinery and Equipment 144

Books and Booklets 150

International Plastics News 160

Production of Plastics Materials 164

THE PLASTISCOPE 188
News of the Industry; Predictions and Interpretations; Company News; Personal; Meetings

Modern Plastics, published monthly by Modern Plastics, Inc., at Emmett St., Bristol, Conn. Executive and Editorial Office: 575 Madison Ave., New York 22, N. Y. Published each month by Modern Plastics, Inc. Entered as second class matter at the Post Office at Bristol, Conn., December 14, 1950, under the act of March 3, 1879.

Copyright 1951 by Modern Plastics, Inc. All rights reserved.

Subscription $5.00 a year, $8.00 for two years in the U.S., its possessions, and South America. Canadian subscription $5.00 a year, $8.00 for two years. All other countries $5.00 a year, $8.00 for two years, payable in U.S. currency. Price of this issue 75 cents per copy. Printed in the U.S.A. by the Hildreth Press, Inc., Bristol, Conn.

* Reg. U.S. Pat. Office

Another new development using

B. F. Goodrich Chemical Company ***raw materials***

Made throughout of GEON 404 —no metal used!

HERE'S a new development that shows how Geon 404, a new rigid vinyl plastic, can solve costly problems involving acids and other corrosive elements. The tank is used in a water supply plant. It holds about 20 gallons of hydrofluosilicic acid, used in drinking water to help and protect hardness of teeth.

Naturally, the tank has to be extremely resistant to the highly corrosive acid. And it is, from top to bottom! For the tank, and every nut, bolt and stud in it are made of Geon 404 rigid plastic. No metal is used—no part of this tank can ever corrode.

Geon 404 has advantages that make it ideal for many rigid applications. It possesses all the excellent properties of straight polyvinyl chloride. It can be processed without plasticizer addition on standard equipment, using standard methods.

Geon 404 has outstanding chemical resistance, exceptional strength and excellent electrical properties. At ordinary temperatures it is not affected by acids, alkalies, salts, oxidizing agents . . . or oils, greases, alcohols, gasoline and carbon tetrachloride. Send for Technical Bulletin and helpful advice on the use of Geon 404. Please write Dept. GA-11, B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco.

GEON RESINS • GOOD-RITE PLASTICIZERS...the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors

Plenty of tough problems are solved with EXTRA STRENGTH PLASTICS

Do you have a plastics application where strength is a requirement? Then you should investigate the advantages of modern extra strength plastics. These materials, combined with various types of fillers, can be molded to withstand stress, strain and impact to a remarkable degree. Furthermore, these materials are light weight. Many are resistant to various oils and chemicals and have excellent heat and electrical insulation characteristics.

Be sure to get the right material. Not all of these qualities are available in any one material but the experienced molder knows just what material or combination of material and filler will best meet your requirements. That's why it's important that you select a source like Chicago Molded. For here you will find a rare combination of know-how and facilities backed by more than 30 years experience in plastics . . . a combination that insures successful results right from the start.

We mold ALL plastic materials. And we have the most modern facilities for all three methods of molding . . . compression, injection and transfer. So . . . whatever your job may call for, our recommendations will be unbiased. We are only concerned with producing the best possible results for you. No doubt that is one of the reasons why 60% of our business comes from firms we have served for 15 years or more.

You'll find it time well spent to discuss your next molded plastics job with a Chicago Molded engineer There's no obligation. Just write, wire or phone.

CHICAGO MOLDED
PRODUCTS CORPORATION
1046 North Kolmar Avenue, Chicago 51, Illinois

Ask for your copy of this booklet

It's packed with interesting factual information about plastics, their characteristics, applications, and methods of molding them. Write for your copy today, on your company letterhead, please.

This Warner Electric Brake Plug is molded of high impact canvas filled phenolic. It's light in weight with extra impact strength and good electrical insulation.

A high impact phenolic with macerated canvas filler gives this Sunbeam Hedge Trimmer handle extra strength with excellent electrical and heat insulation and light weight.

This spinner for the Zebco Casting Reel is molded of a melamine-formaldehyde material with cotton cloth filler. It's light in weight with high flexural strength to withstand pull, and excellent water resistance.

This massive Halliburton Oil Well Valve Seat is of high impact phenolic filled with macerated canvas. It has the strength to resist tremendous pressure, yet is easily drilled out when job is completed.

CHICAGO MOLDED PLASTICS

CUSTOM MOLDERS OF ALL PLASTIC MATERIALS

EDITORIAL

The New S.P.I. Marketing Committee

An important change in the committee setup of The Society of the Plastics Industry has just been made public.

First, the work of the Public Relations Committee has been expanded and accelerated. Second, the former Informative Labelling Committee now becomes the Marketing Committee with a broad field of operations, including studies of distribution patterns, trade practices, advertising problems, color coordination, informative labelling, cooperative promotion, standards, and guild marks.

These two committees will work closely together and with all other committees through sub-committees. Where their activities can bring value to the entire industry, S.P.I. will finance them; when only one section of the industry can benefit by any particular activity, it is expected that that section will cooperate in the effort, not only by working on it, but by contributing separate funds to cover expenses involved.

This is a healthy development. While the by-laws of S.P.I. have always permitted any section or group in the industry to engage in worthwhile committee projects with the use of S.P.I. machinery and the prestige of S.P.I. auspices, many specialized interests in the industry have hesitated to request such committee projects because of lack of understanding of the possibilities.

There is no longer any excuse for anyone to say, "S.P.I. does not handle this or that type of project," because S.P.I. can organize and establish any committee project of any size, direction, or duration required by any section of the plastics industry. Furthermore, the integration of and cooperation between the various sectional committees in S.P.I. makes the work of each committee smoother and more effective.

Marketing of plastics and plastics products is a matter affecting each section of the industry, and to that extent represents an over-all problem. But marketing involves different techniques, different areas of operation, different trade and promotional problems to every section.

Therefore, the establishment of a central Marketing Committee which can engage in activities of value to the industry as a whole within the S.P.I. budget, yet which can take up the marketing problems of specialized sections of the industry as required by means of special budget arrangements, should make S.P.I a much more useful organization to many more companies in the industry.

However, neither S.P.I nor any committee of S.P.I. can serve properly where service is not requested and where complete cooperation is not forthcoming from those who do request the service. In the case of the new Marketing Committee, money won't be half as big a problem as sub-committee man power. It's up to top management in each company in each section of the industry which may gain through Marketing Committee activities to nominate for service on the Committee or on sub-commitees qualified executives from its own staff, and to make these men available for meetings and such other work as may be required. It is also up to individual company managements to present to the Committee its ideas on the problems faced by companies within its section which may best be studied and resolved by mutual action.

Committee work is a job that cannot be delegated. It's a job requiring time and trouble on the part of individual men at management level. In our present economy, it's a most important job!

President and Publisher

CHARLES A. BRESKIN

Editorial Staff

Editor: HIRAM MCCANN
Technical Editor: DR. GORDON M. KLINE
Engineering Editor: FRED B. STANLEY
Senior Editor: R. L. VAN BOSKIRK
Managing Editor: A. PAUL PECK
Art Director: DONALD R. RUTHER
Associate Editor: WARREN H. GOODMAN
Assistant Managing Editor: E. S. BLACK
Assistant Editor: JOAN MOISSEIFF
Midwestern Editor: VAL WRIGHT
Readers Service: EMMA TURAK

Business Staff

Vice President and General Manager: ALAN S. COLE

P. H. Backstrom — B. W. Gussow
M. A. Olsen — W. F. Kennedy
J. M. Connors — J. C. Galloway
R. C. Beggs — S. S. Siegel

Promotion Manager: PHILIP W. MULLER
Production Manager: DANIEL M. BROADS
Asst. Production Manager: B. J. FARINA
Production: ELAINE F. KATZ
Asst. to Publisher: THEODORE B. BRESKIN

Circulation Department

Circulation Manager: FREDERICK A. KLEIN

Executive and Editorial Offices

575 Madison Ave., New York 22, N. Y.
Tel., PLaza 9-2710

Branch Offices

Chicago 11: 101 E. Ontario St.
J. M. Connors — Tel., Delaware 7-0060

Cleveland 14: 815 Superior Ave.
R. C. Beggs — Tel., SUperior 1-0737

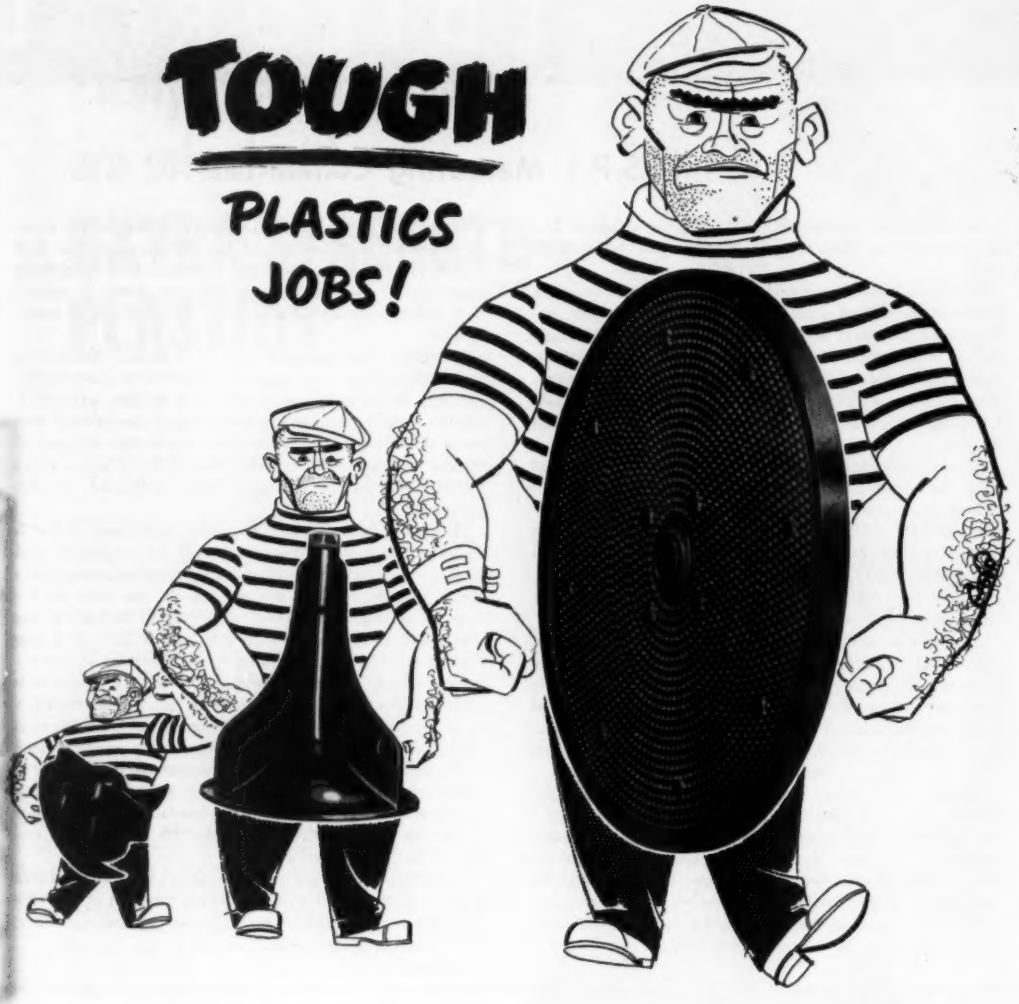
Los Angeles 17: 816 West Fifth St.
J. C. Galloway — Tel., Mutual 8335

England: 10/12 Broad St. Ave., Blomfield St., London, E. C. 2
L. H. Dolaro — Tel., London Wall 4231

MODERN PLASTICS is fully protected by copyright and nothing that appears in it may be reprinted wholly or in part without special permission.

Member Audit Bureau of Circulations
MODERN PLASTICS is regularly indexed in Industrial Arts Index and Industex.

TOUGH PLASTICS JOBS!



Send them to RICHARDSON!

If you have a plastics molding job that presents a real problem —involving special materials, special design, or special production techniques—send it to The Richardson Company. Richardson engineers have helped manufacturers in practically every industry find the solution to their difficult plastics problems. Furthermore, Richardson engineering skill is backed by extensive molding, laminating, and fabricating facilities. In one or more of Richardson's six plants you will find standard and special machinery capable of handling volume production of practically any plastics part.

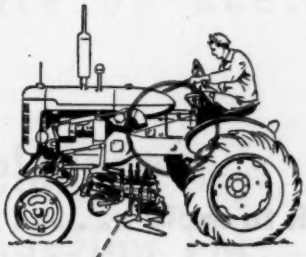
Write for illustrated booklet on **INSUROK®** Laminated and Molded Plastics

The RICHARDSON COMPANY

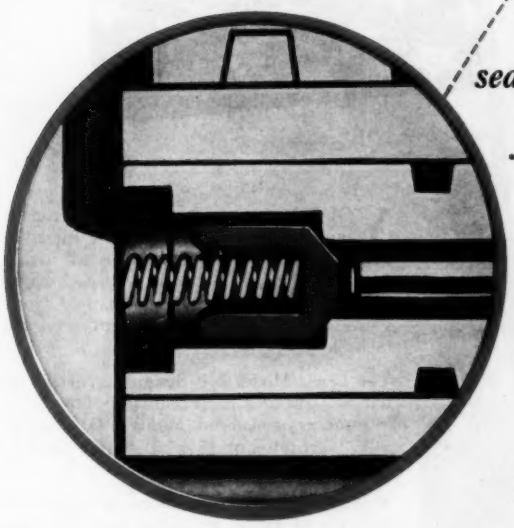
FOUNDED 1858 — LOCKLAND, OHIO

2789 Lake St., Melrose Park, Illinois (Chicago District)

SALES OFFICES: Cleveland • Detroit • Indianapolis • Lockland, Ohio • Los Angeles Milwaukee • New Brunswick, (N.J.) • New York • Philadelphia • Rochester • St. Louis



Leak-proof check valve of resilient Du Pont nylon



seats perfectly without machining,

...gives long, trouble-free service

Two nylon check valves, like the one above, stop the flow of oil from either side of the hydraulic power piston. Thus, they keep the plow or other implement locked in position at the proper level.

For the hydraulic Touch-Control lift on "Farmall" tractors, International Harvester engineers needed a perfectly leak-proof check valve. This vital part traps oil on both sides of the power piston, thus holding the implement rigidly in the selected position. By molding the valve of Du Pont nylon, many advantages over the former steel part have been obtained.

Because of its resiliency, the nylon plastic part provides a tight seal, even if there are slight imperfections in the mating surface . . . does not become worn or grooved after repeated contact with the bushing. Too, the nylon part is made in one piece by the rapid mass-production injection-molding process . . . needs no costly machining to provide a smooth seat within close tolerances.

Du Pont nylon withstands the high temperature of the oil in the system (up to 200° F.), and remains dimensionally stable, chemically inert. Two years of trouble-free service in "Farmall" tractors have demonstrated the value of nylon valve seats.

Perhaps nylon's strength, resiliency and other valuable properties can help solve a problem for you. For further information on nylon and other Du Pont plastics, write:

E. I. du Pont de Nemours & Company (Inc.)
Polychemicals Department, District Offices:
350 Fifth Avenue, New York 1, New York
7 S. Dearborn St., Chicago 3, Illinois
845 E. 60th St., Los Angeles 1, California

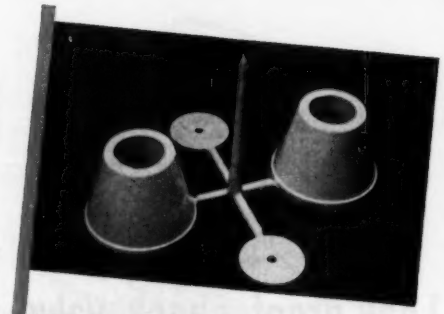
Nylon part molded by Formold Plastics, Inc., Chicago.

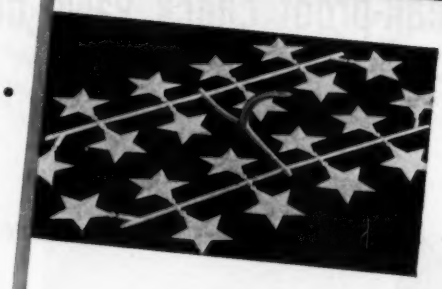
DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY
Polychemicals
DEPARTMENT
PLASTICS • CHEMICALS

if it's tough to mold . . . . . .

or has to be budget-priced . .

CUT PARTS COSTS with a LEWIS "4"





YOUR large-area, small-shot parts can be molded on a Lewis Model 4 Injection Molding Machine, releasing a high-cost 8-ounce machine to work on larger parts. Cost of operation goes down, less floor space is used per machine, your profit picture looks much better.

The Lewis Model 4 is designed specially to handle large-area parts requiring shots up to 3½ ounces of material. Molds as large as 12" x 23" vertically, or 13⅛" x 20" are readily installed on a Lewis "4."

Multiple-shot injection assures greater uniformity of parts, provides high injection pressures at low plunger pressures.

Exclusive fast-opening crank-operated die-lock mechanism permits rapid clearing of clogged nozzles in as little as 20 seconds.

Minimum floor-space requirements . . . only 16 square feet . . . lets you install a battery of Lewis "4's" almost anywhere, help cut your operating overhead. Operation is quiet, can be automatic if you desire.

Any material from nylon to styrene is molded quickly, economically on a Lewis "4."

Get facts and specifications today. Address:

LEWIS

THE LEWIS WELDING AND ENGINEERING CORP.

1 Interstate Street • Bedford, Ohio

Are You Up-to-date on Acetate?

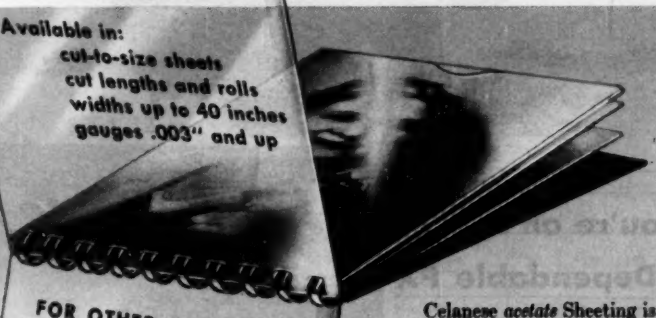
Celanese* *Acetate* Sheeting For . . .

WALLET ENCLOSURES

Acetate:
- scores better
- cuts easier
- blanks perfectly

Can be:
- stitched
- solvent bonded
- cemented to other materials

Available in:
- cut-to-size sheets
- cut lengths and rolls
- widths up to 40 inches
- gauges .003" and up



FOR OTHER PRODUCTS

Can be:
- heat formed
- drawn
- blown

Perfect surface for:
- printing
- stencilling
- silk screening

Obtainable in:
- transparent
- translucent
- clear colors
- opaque colors
- pearl effects
- mat surfaces

Celanese *acetate* Sheeting is the unexcelled material for displays, printed products, watch and dial crystals, optical frames, lamp shades, and literally thousands of other products and parts as well as wallet enclosures. Get complete information from your Celanese representative. Celanese Corporation of America, Plastics Division, Dept. 101-K, 180 Madison Avenue, N. Y. 16. In Canada, Canadian Cellulose Products, Ltd., Montreal and Toronto.

Celanese* Acetate SHEETING

*Reg. U. S. Pat. Off.

You're on the *Right Course* with Dependable PX Plasticizers!

The jobs for plastics are growing—and growing *tougher*—every day! The military, for example, is using dozens of new products made of versatile vinyl plastics—products which must take a regular diet of heat, cold, abrasion or constant flexing.

To a large degree it's the *plasticizer* that makes these articles so durable and useful. That's why manufacturers demand plasticizers of uniform maximum quality . . . an advantage they're assured of when they specify Pittsburgh PX Plasticizers.

As a basic and integrated producer of coal chemicals—benzene, xylene, pyridine and phthalic anhydride, to name just a few—we're able to control and maintain the high quality of our plasticizers from coal to finished product. And that means better performance and ease of use in your formulations.

Whether you're considering plasticizers—or the basic products of our other integrated divisions—remember that the Pittsburgh name and trademark stand first and foremost for *reliability.*

PX-104	DiButyl Phthalate
PX-108	DilsoOctyl Phthalate
PX-138	DiOctyl Phthalate
PX-208	DilsoOctyl Adipate
PX-404	DiButyl Sebacate
PX-408	DilsoOctyl Sebacate
PX-658	TetraHydroFurfuryl Oleate
PX-917	TriCresyl Phosphate

W&D 3888

PITTSBURGH COKE & CHEMICAL CO.

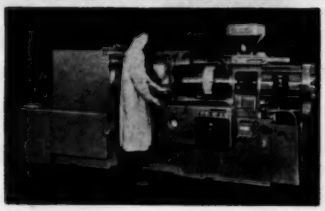
COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

IT ALL ADDS UP... TO SATISFACTION!

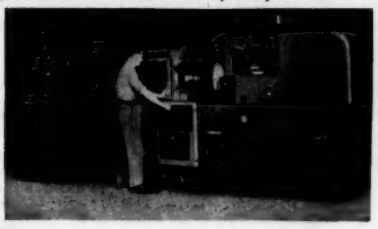
The functional design and dependable performance of Reed-Prentice Injection Molding Machines plus their economical operation and versatility add up to complete satisfaction for molders everywhere.

Reed-Prentice offers injection presses from 2 to 200 oz. for every molding need. If you have a thermoplastic molding problem, call on Reed-Prentice — builders of over 2500 injection machines — for full information on machines and molds. Send for Catalog on all "Reeds" — from 2 to 200 oz. capacity.

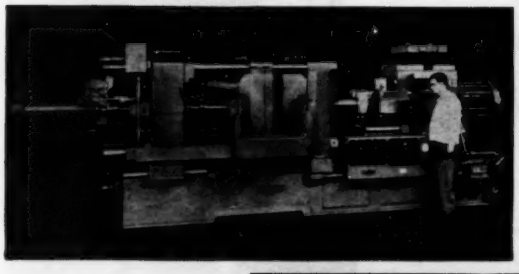
10D-8 oz.



10D-12 oz

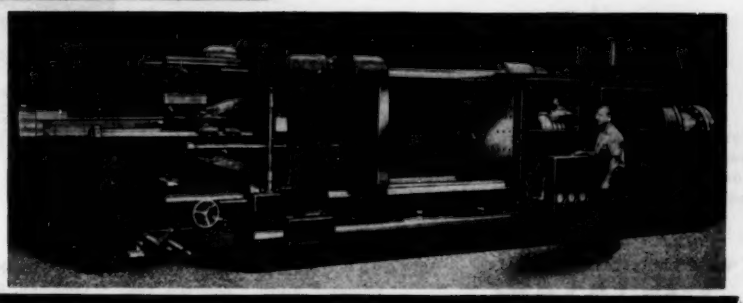


600T-32 oz.



Specifications	4 oz.	8 oz.	12 oz.	16 oz.	24 oz.	32 oz.	200 oz.
Die locking pressure, tons	125	275	275	400	600	600	1200
Rated Casting area, sq. in.	50	125	125	150	300	300	600
Mold opens	8"	10¼"	10¼"	16"	24"	24"	36"
Max. die space	12"	16"	16"	24"	28"	28"	40"
Size of die plates	16x21"	21x25"	21x25"	40x45"	45x54"	45x54"	60x72"
Weight, lbs.	9700	12,850	16,250	31,500	45,100	46,100	92,000

1200T-200 oz.



THE WORLD'S LARGEST MANUFACTURERS OF INJECTION MOLDING MACHINES

REPRESENTATIVES:
Detroit ..... Kordenbrock Machinery Co.
Grand Rapids ..... Joseph Monahan Co.
Syracuse ..... J. F. Owens Machinery Co.
Houston ..... Preston Machine Tool Sales Co.
Seattle & Spokane ..... Star Machinery Co.
Minneapolis ..... Chas. W. Stone Co.

INJECTION REED-PRENTICE CORP. WORCESTER MACHINES MASS., U.S.A.

MAIN OFFICE
677 Cambridge St., Worcester 4, Mass.
BRANCH OFFICES
75 West St., New York 6, N. Y.
1213 West 3rd St., Cleveland 13, Ohio
2400 W. Madison St., Chicago 12, Illinois
2314 Santa Fe Ave., Los Angeles 58, Calif.

Proof that METASAP STEARATES MEAN BETTER MOLDING

Here's proof, in 3 pictures, that Metasap Stearates can help you do an excellent molding job:

1

Picture 1 shows a preform such as no molder wants. It was obtained during extensive tests run by the Watertown Manufacturing Company, and proved typical of a large number of preforms molded from compounds that did NOT contain Metasap Stearate as lubricant. Such preforms required an average pressure of 50 lbs. to eject them from the mold, and an unprofitably large percentage were delaminated in the ejection process.

2

Picture 2 shows a typical preform obtained, during the same tests, from molding compounds containing Metasap Calcium Stearate. Perfect in shape, such preforms required only 10 lbs. of pressure to release them from the mold.

Picture 3 shows how early in the manufacturing cycle the advantages of Metasap Stearates can be realized. In rolling sheets of molding compound (prior to grinding for powder) the inclusion of a Metasap Stearate aids in preventing the material sticking to the rolling mill.

Photos courtesy of Watertown Manufacturing Co., Watertown, Conn.

ADD IT ALL UP—and the answer is plain:

Lubricating with Metasap Stearates assures—

Improved Preforms—without delamination . . . since high ejection pressures are unnecessary.

Improved Finished Products—clean cut, with more marketable finish.

Increased Output—Rapid, easy ejection avoids waste of time and effort—assures fewer rejects.

Increased Economy—Preform molding can be done with machines of less tonnage. Molding materials are conserved. Mold life is increased—because scoring is virtually eliminated.

Metasap Zinc and Calcium Stearates, for use in molding plastics, assure significant manufacturing economies all along the line—and better products, too. Today, when you must produce *quality* and sell *competitively* you'll find Metasap stearate lubrication an indispensable aid to more profitable operation.

For complete information, write

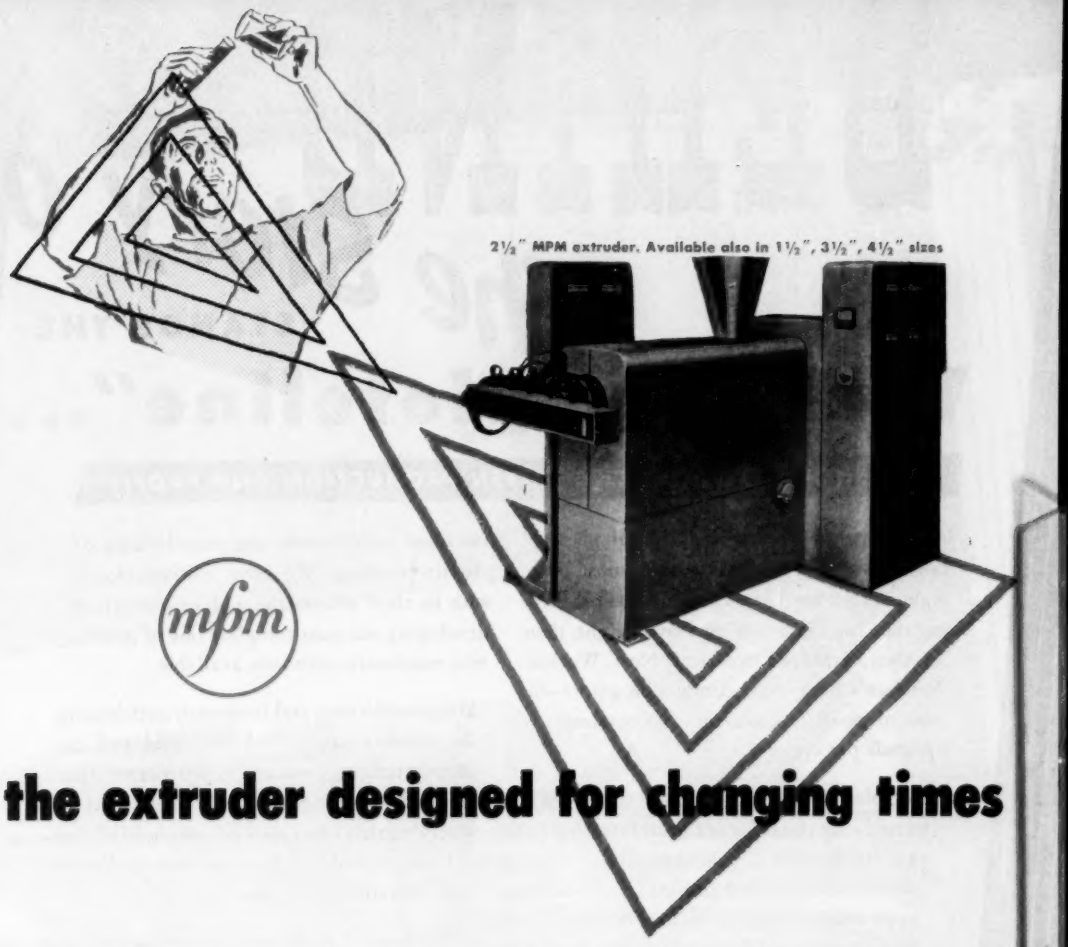
METASAP CHEMICAL COMPANY, HARRISON, N. J.

Chicago • Boston • Richmond, Calif. • Cedartown, Ga.

METASAP CHEMICAL COMPANY REG. U.S. PAT. OFF.

Stearates

of Calcium • Aluminum • Lead • Magnesium • Zinc



2½" MPM extruder. Available also in 1½", 3½", 4½" sizes

the extruder designed for changing times

Experts agree that plastic materials are barely beyond the threshold of their development. New formulations with new characteristics, only laboratory curiosities today, will soon be taking their place beside vinyl and styrene.

And applications are expanding, too, particularly in the extrusion field. Large diameter tubing and wide extruded film, for instance, both only dreams a year or two ago, now are in daily production.

When selecting an extrusion machine, it's important to keep these facts in mind. You need an extruder that's versatile . . . that can keep pace with new materials and with increasingly complex requirements. That extruder is an MPM.

Every MPM extruder has from 9 to 15 radial jacketed cooling zones for controlling frictional heat, and six individually controlled electrical heating zones. Automatic temperature regulators are provided for the die head and for the cylinder. It's this unexcelled heat control system which guarantees MPM performance with the materials which are now being created.

Materials manufacturers recognize the versatility of MPM extruders. Eighteen of them—among the largest in the country—depend on MPM machines in their laboratories for experimental extrusion work.

The flexible performance of MPM extruders is important today, more important tomorrow. Write for further details.

California Representative:
WEST COAST PLASTICS DISTRIBUTORS, INC.
2325 Jesse Street, Los Angeles 23, Cal.

modern plastics machinery

15 Union St., Lodi, N. J., U. S. A.
Cable Address: MODPLASEX

BEHIND The Story of STANDS THE W-S "Completeline"...

THE SHORTEST DISTANCE BETWEEN PRODUCTION AND PROFIT

In a fast-paced industry like that of plastics molding, news becomes history almost over night. Only a few years ago, W-S was pioneering the "big" injection machines—eight, then 12, then a fabulous 16 ounces! Now, Watson-Stillman's high-speed production giants—the size of small locomotives — shoot almost 20 *pounds* per cycle.

Yes, plastics molding has come of age. What started only yesterday as a manufacturing business has become a major industry . . . its applications tested and proved . . . its markets huge and growing . . . its materials and products pronounced "critical" in the most vital fields of civilian and defense production.

W-S is proud of its right to claim an associate editorship in the "writing" of this typically American success story—the encyclopedia of plastics molding. We have worked closely with its chief editor—the molder himself—in developing the most complete line of production machinery anywhere available.

Always reflecting, and frequently anticipating the molders' needs, W-S has developed machinery ranging from one to 300 ounces capacity, and including complete installations for every material and method commercially employed in molding by compression, transfer, and injection techniques.

This kind of close association with the beginning, development, and assured *future* of the industry makes W-S more than ever your logical first-choice consultant on your present expansion or new-plant planning.

HYDRAULIC MACHINERY DIV. **WATSON-STILLMAN** Established 1848

Main Office and Plant: 150 Aldene Rd., Roselle, New Jersey
Branch Office: 228 No. La Salle St., Chicago, Illinois
Manufactured in Canada by — Canadian Vickers, Ltd., Montreal

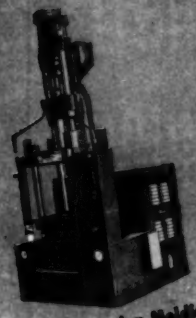
REPRESENTATIVES

Akron, Ohio — Watson-Stillman Co.	Los Angeles 11, Cal. — H. M. Royal, Inc.
Birmingham 3, Ala. — George M. Meriwether	Pittsburgh 19, Pa. — Stanley Berg & Co.
Buffalo, N. Y. — Don. W. Patterson Co.	San Francisco, Cal. — Shallenbach Mach. Tool Co.
Dallas, Texas — M & R Sales Company	St. Paul 4, Minn. — Anderson Machine Tool Co.
Denver 2, Colo. — Overgard Machine Tool Co.	Seattle, Wash. — Machinery & Tool Supply Co.
Indianapolis, Ind. — W. K. Millholland Mach. Co.	Spokane 8, Wash. — Machinery & Tool Supply Co.

Foreign Sales Representative: OMNI PRODUCTS CORP., 460 Fourth Ave., New York 16, N. Y.
Correspondents Throughout the World

9-1-19

PLASTICS MOLDING...



Vertical Injection Molding Machines 1, 2, 4 and 6 oz.

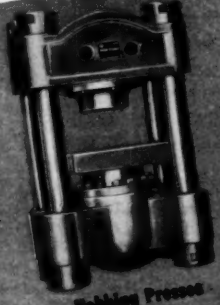
2 oz. Semi-Automatic Injection Molding Machine.

Transfer Molding Machines 30 to 1200 Tons.

Thirty Tableting Machines 10 and 100 Tons.

W-5 300 oz.
Injection Molding Machine
Die space 48" x 72" — Clamp 1500 Tons

Compression Molding Presses-50 to 1200 Tons.



Rubber Presses 250 to 2000 Tons.

Horizontal Injection Molding Machines-8 to 300 oz.

NIXON PLASTICS

Sheets • Rods • Tubes

cellulose acetate
cellulose nitrate
ethyl cellulose
cellulose acetate butyrate

Rigid Vinyl Sheeting

Molding Powder

cellulose acetate
ethyl cellulose

NIXON NITRATION WORKS

Founded 1898

NIXON • NEW JERSEY

Home Office: NIXON, NEW JERSEY
Phone: New Brunswick 2-1121
New York Extension WOrth 4-5290

M. BREITKOPF W. B. SAVAGE W. A. OLSEN
W. G. TUCKER M. W. PETERS C. E. O'NEAL

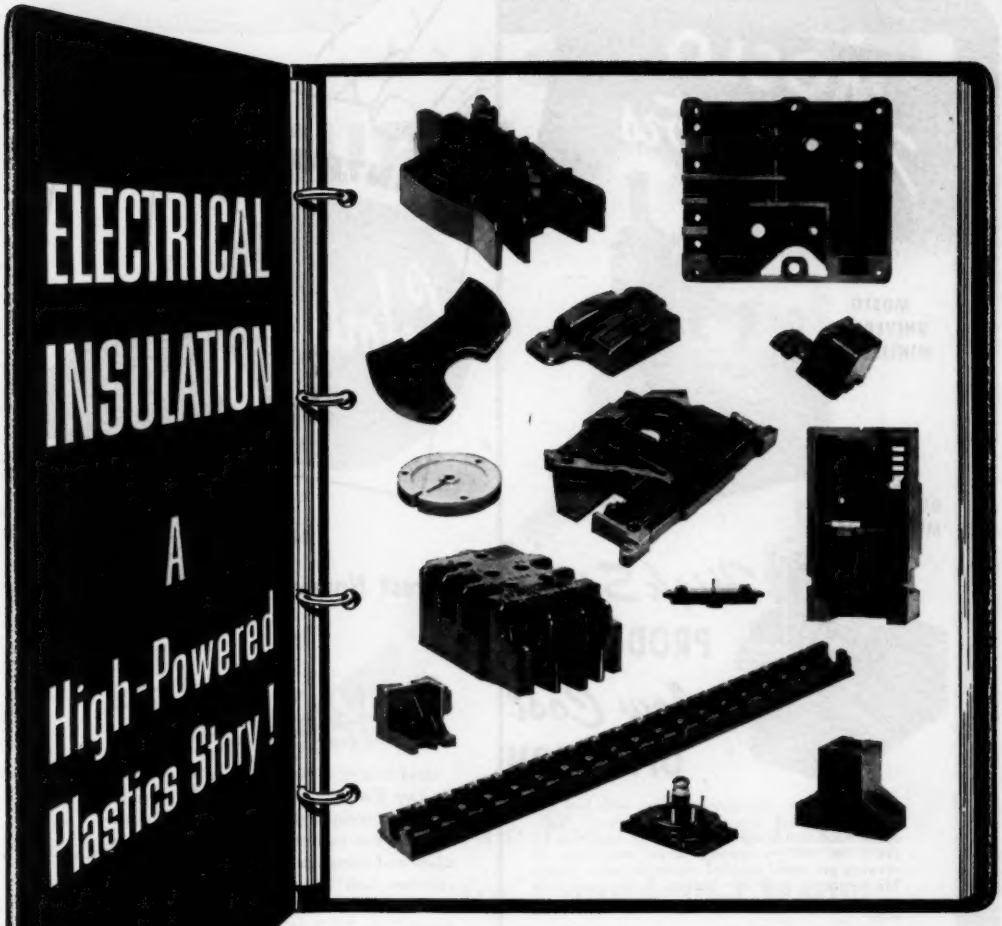
Chicago, Ill.
F. W. LINDAHL
MRS. M. FAHRINGER
310 North Dearborn Avenue
Phone: Michigan 2-2363

St. Louis, Mo.
C. B. JUDD
403 Louderman Bldg.
317 North 11th St.
Phone: Chestnut 8495

New England
Cranston, R.I.
G. L. LOTZ
57 Garden City Dr., Apt. 9
Phone: Stuart 1-4385

Leominster, Mass.
A. F. PERRY CO.
A. F. PERRY
C. A. DOVIDIO
Box 214

Canadian Distributor: Crystal Glass & Plastics, Ltd., 54 Duke Street, Toronto, Ontario, Canada



VERSATILITY—that's the theme of the Kurz-Kasch plastics story in the electronic field. Parts like those above—*millions* of them—are examples of Kurz-Kasch mass-production moulding of all types of thermosetting compounds during war and in peacetime. They measure up to exacting dimensions—pass underwriter requirements—are produced by the millions from moulds made for long productivity. They exemplify the sound and economical moulding methods we've helped to pioneer for the use of our country's leading electrical manufacturers. That's a "nutshell" story of what Kurz-Kasch has been able to do in the electrical field alone. Our entire output, of course, goes further—to a complete cross-section of American industry. Maybe we can help *you*. You can find out by telephone.

Kurz-Kasch, Inc. • 1415 South Broadway • Dayton 1, Ohio

BRANCH SALES OFFICES: New York, *Lexington 2-6677* Rochester, *Hillside 2415M* • Chicago, *Harrison 7-5473* Detroit, *Trinity 3-7050* • Philadelphia, *Granite 2-7484* Dallas, *Lakeside 1022* • Los Angeles, *Prospect 7503* St. Louis, *Delmar 9577* • Toronto, *Riverdale 3511*

EXPORT OFFICE: 89 Broad Street, New York City, *Bowling Green 9-7751.*

Kurz-Kasch

FOR OVER 35 YEARS PLANNERS AND MOULDERS IN PLASTICS

MOSLO *Minijectors*

MOSLO UNIVERSAL MINIJECTOR

MOSLO DUPLIMATIC MINIJECTOR

High Speed PRODUCTION *Low Cost* OPERATION

Want *volume* injection molding with low die expense? Then investigate these small high-speed Moslo Minijectors—which in hundreds of cases are out-performing larger machines in turning out small molded pieces or parts. Every Minijector is built for lasting service and will provide economical, efficient, automatic operation.

MOSLO DUPLIMATIC MINIJECTOR—especially for insert molding of cord-plugs, switch parts, etc. A two-sided self-positioning lower mold section allows operator to remove finished molded part from the mold section and refill with new inserts while the other mold section is in cycle. Automatic hydraulic operation provides for complete operator safety. Mold casting area 40 square inches. Injection pressure 20,000 p.s.i. Injection capacity to 4 oz.

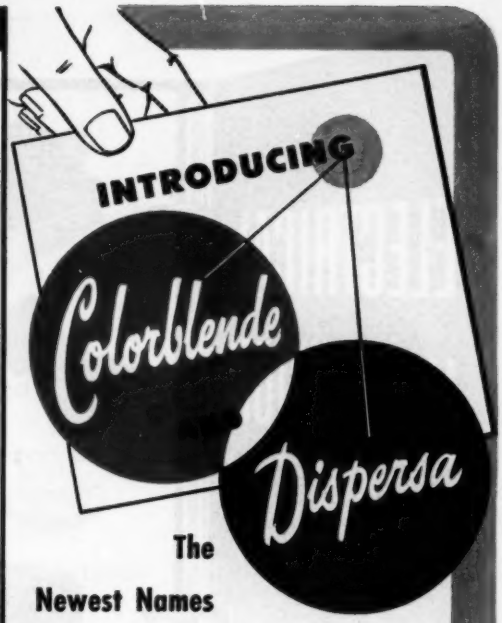
MOSLO UNIVERSAL MINIJECTOR—A versatile, high-speed molding machine of up to 4 oz. capacity. Universal mold-clamp assembly readily accessible to operator allows mold to be changed in minimum time. Fully automatic hydraulic operation. Injection pressure 16,250 to 20,000 lbs. p.s.i. Casting area 30 to 60 square inches.

It will pay you to write today for complete information.

TERRITORIES OPEN FOR DISTRIBUTORS

MOSLO ENTERPRISES

MOSLO MACHINERY COMPANY
2443 PROSPECT AVENUE • CLEVELAND 15, OHIO



The Newest Names In Dry Colorants

Mid-America Plastics, Inc., is operating its Dry Color Division under full production. A completely equipped laboratory and modern manufacturing facilities formulate and compound "Colorblende" the dry colorant, and "Dispersa" the wetting agent. You can get immediate delivery of "Colorblende" in 17 Bureau of Standards colors or specify any special colors.

We invite your inquiry—write today for our price list and Color Comparison Chart. Upon request we will send without charge a sample of any standard color of your choice. "Colorblende" and "Dispersa" are packaged in convenient containers — in 50# or 100# units ready to color your crystal styrene in any mixing drum.

Quick — Easy — Dust Free — Economical

TERRITORIES OPEN FOR DISTRIBUTORS

MID-AMERICA PLASTICS, INC.
COLOR DIVISION
2443 PROSPECT AVE. • CLEVELAND 15, OHIO

BE SURE!

See Bridgeport FIRST for Complete Plastic Molding Service

You can't miss
when you call on Bridgeport
for plastic molding needs . . .
big or small.
We have the knowledge,
manpower, equipment, and facilities
to solve *every* problem.

Bridgeport Moulded Products, Inc.
BOX 3276, BARNUM STATION BRIDGEPORT, CONN.

Another successful development using AMERICAN ANODE *materials*

Sea-going sponge of a hundred uses!

THIS remarkable new American Anode material is a closed cell sponge made from vinyl chloride. Because of its closed cell construction and more advantages, it has dozens of shipboard uses—life preservers, gaskets, chair seats—wherever a light, tough, climate-resisting material can be used.

The sponge is extremely resistant to the damaging effects of air, sunlight and salt-spray . . . greases, oil and most chemicals. Ordinary temperatures won't harm it. Its flame-resistance makes it especially useful in shipboard furniture. In many ways, this vinyl sponge can do jobs better than other sponge materials.

Naturally, this versatile new material has many "shore" uses also—from shoulder pads for men's and women's clothes to cushioning for the inside of battle tanks.

It's another example of the wide range of applications for American Anode materials—in both civilian and defense uses. Wherever special coatings or plastisols (vinyl plastic paste) can be used to improve or develop products, we can help you. We can design, manufacture and deliver the finished product. If you're interested, please write Dept. AC-6, American Anode Inc., 60 Cherry Street, Akron, Ohio.

AMERICAN ANODE

CRUDE AND AMERICAN RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS, AMERAN RESIN PASTES, COMPLETE MANUFACTURING FACILITIES

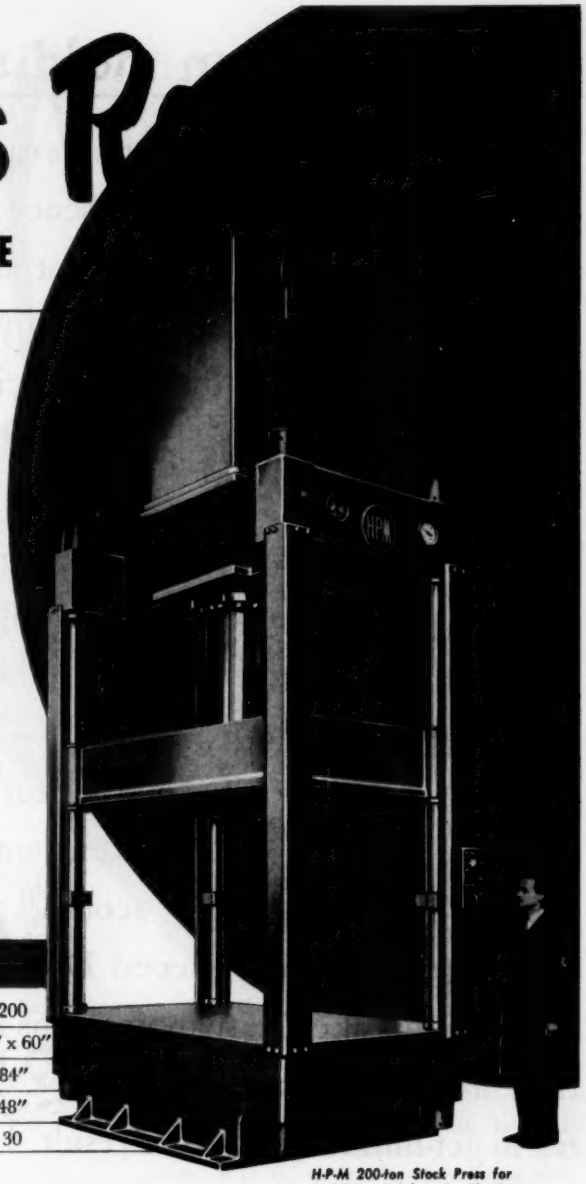
H-P-M's R

with a STANDARD LINE of PRESSES for REINFORCED PLASTICS

Yes, H-P-M has kept pace with the rapid developments in the molding of reinforced plastics! By working closely with Owens-Corning, the firm who developed Fiberglas molding, a stock line of H-P-M presses has been designed to meet the requirements of this new molding industry.

Each press is a self-contained unit, powered by dependable H-P-M built pumps, valves and controls. Semi-automatic control provides fast closing action . . . automatic slow-downs . . . and accurately controlled pressures with press cycles to meet exacting production needs.

Are you planning to use this new "wonder" plastic? If so, write for H-P-M's stock press bulletin No. 5107.



H-P-M 200-ton Stock Press for Molding Reinforced Plastics

SPECIFICATIONS

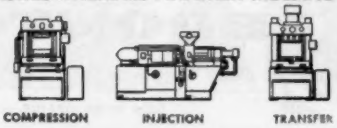
Tonnage	100	150	200
Mold Size (max.)	48" x 36"	60" x 48"	84" x 60"
Daylight	84"	84"	84"
Stroke	48"	48"	48"
Motor HP	10	10	30

HPM

THE HYDRAULIC PRESS MFG. CO.

1010 MARION RD., MT. GILEAD, OHIO, U. S. A.

PLASTICS MACHINES FOR EVERY MOLDING JOB



COMPRESSION INJECTION TRANSFER

Make your own moldings...it's a cinch

First you need a mold—that's easy. You show the model or print to a tool maker in the presence of the plant doctor. It is not necessary to use the first aid room unless it is a very large and complicated piece. Then you buy a press. You need not go into the detailed specifications — they call the platinum bearings by some fancy name, and never mention the fact that every employee of the press maker has one Cadillac and wants another. You can figure that out for yourself. Now you start negotiating for some plastic molding material. That's exactly the word — "negotiate". Next you need high pressure steam — and you don't get it by speeding up the coffee percolator in the boss' office. You combine all this — let the same amount of time pass that you need to reduce your golf score ten strokes — then the Great Day. You press pieces! Don't do this on July 4th you will mistake the snapping pins for patriotic sounds, which they are not. Then you call in a competent molder and try to get him to salvage the result. He won't like it but will be as nice as he can be, after all — you're still solvent (he hopes) and he may get a Cadillac, too. Try us — we've got ours.

BOONTON MOLDING CO.

BOONTON, NEW JERSEY

NEW YORK OFFICE — CHANIN BUILDING, 122 EAST 42ND STREET, MURRAY HILL 6-8540

product improvement comes with PLIOLITE S-6

(photo courtesy American Hard Rubber Company)

DRIP-PROOF, UNBREAKABLE *acid pail with exceptional toughness, resilience, chemical resistance. Manufactured by American Hard Rubber Company.*

Outstanding example of product improvement is this new chemical bucket by the American Hard Rubber Company. Working with Goodyear technicians, this manufacturer developed a unique combination of rubber, other ingredients, and PLIOLITE S-6 (Goodyear's styrene-butadiene copolymer for rubber reinforcing).

The resulting compound gave a bucket that has:

- High chemical resistance
- Excellent resistance to impact
- Toughness over a range of temperatures
- Light weight
- Ease of processing in manufacture

Your product may well be improved through compounding with a blend of PLIOLITE S-6 and either natural or synthetic rubber—thanks to the versatility of such compounds. Ask for further details as your first step to new product quality.

USE PROVED *Products*

And although PLIOLITE S-6 is currently in short supply, you can put your laboratory to work now on evaluation of this resin. For full details and sample, write:

Goodyear, Chemical Division, Akron 16, Ohio

GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

Pliolite—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

It's not like pulling rabbits out of a hat!

There is no "magical formula" for finding the answer to plastics problems. The answer comes through application of experience, know-how, design, engineering and planning. Here at Quinn-Berry our complete operation is devoted to designing and producing exactly the right plastic part to meet your requirements. Here, under one roof, are all of the components necessary—design, die-making, molding—we control the operation from start to finish.

The next time you have a problem involving plastics, call "Cubee"—he can supply the answer.

Q-B Says:

Our specialty is plastics
That's all that we do
Our every effort
Is planned to serve you.

QUINN-BERRY CORP.
2656 West 12th Street
ERIE, PENNSYLVANIA

Branch Offices:

MR. HARRY R. BRETHEN
15 Lawrence
Detroit 2, Michigan
Phone—Townsend 8-2577

MR. JOHN WEILAND, JR.
7105 Grand Parkway
Milwaukee 13, Wisconsin
Phone—Greenfield 6-7161

MR. H. B. COLLINS, JR.
Fairport Road
East Rochester, New York
Phone—Hillside 2415-M

MR. AUSTIN L. WRIGHT
24 Decatur Road
Havertown, Penna.
Phone—Hilltop 7-0345

FROM BRITAIN

ERINOID Polystyrene is now being produced by Styrene Products Ltd. in their new super-modern plant at Manchester, England.

Styrene Products Ltd. is a joint company of Petrochemicals Ltd. and Erinoid Ltd. The plant has a capacity of 5-6,000 tons per annum.

Absolute purity of product is ensured by sealing all buildings and by air-conditioning throughout. Operation is fully automatic at every stage.

The plant was designed, engineered and constructed by Petrocarbon Ltd. whose comprehensive research facilities, together with those of Erinoid Ltd., will keep the project at the forefront of technical achievement. Consumers will benefit by the considerable operating and marketing experience of the whole set-up.

STYRENE PRODUCTS LTD

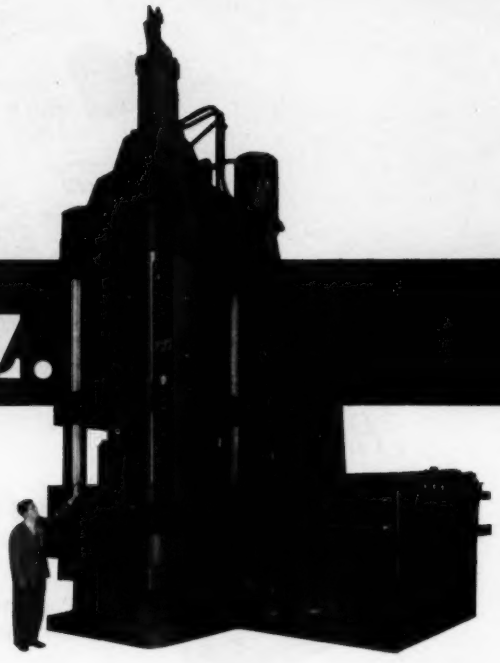
96 PICCADILLY · LONDON · W1 · ENGLAND

Marketing Agents:

ERINOID LTD · STROUD · GLOUCESTERSHIRE · ENGLAND

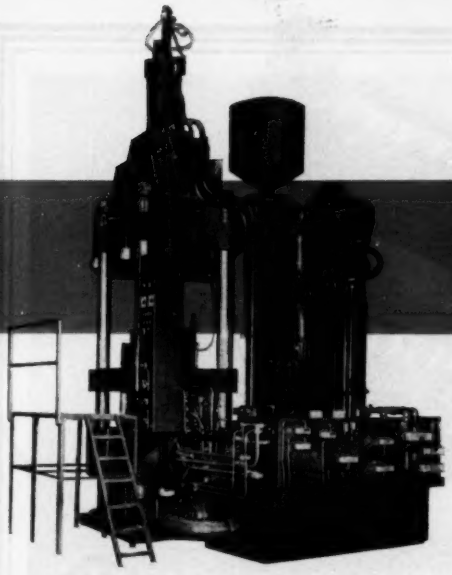
there's a **J-C**
pre-plasticizing press
to meet every
plastics molding
need . . .

200 oz.



first injection molding machine with a capacity of 1000 pounds of styrene per hour on a continuing basis. Makes possible the molding of larger and heavier plastic products. Utilizes frictional heat in conjunction with resistance heat to supply constant viscosity material to the injection chamber. Results in more projected area per ton clamping pressure . . . more strain-free moldings . . . less scrap! Permits coloring and molding in one operation. Injects uniformly plasticized material directly into the mold without torpedoes, auxiliary plungers and other supplementary devices. Potential capacity: 300 oz. at 45 second cycle with substitution of 300 oz. chamber.

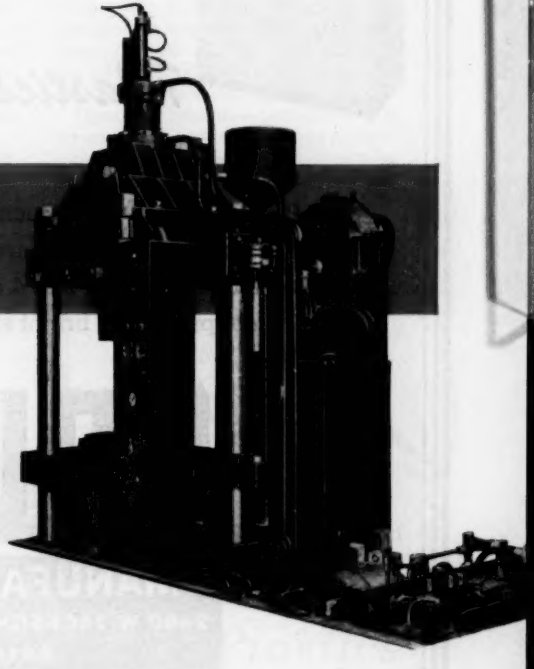
IF it can be molded . . . J-C makes the press to do it . . . up to 300 oz. Write for detailed specifications on the model to fit your needs.



72 oz.

pre-plasticizes over 410 pounds of styrene per hour.

Produces *700 square inches projected area . . . 40 second cycle . . . 750 tons locking pressure. Pre-plasticizing member has four temperature controls with specially designed stainless steel hopper and extruder pump. Has water-cooled thrust bearing and leak-proof lubricant seals, as well as standard coupling and gear boxes for easy maintenance.



48 oz.

shoots 500 square inches of projected area in fast cycles.

Versatile, all-in-one press operates at lower injection pressures for substantial weight savings. *Shots can be made in 30 second cycles from 48 ounces to 6 ounces. Has coloring advantages of larger presses.

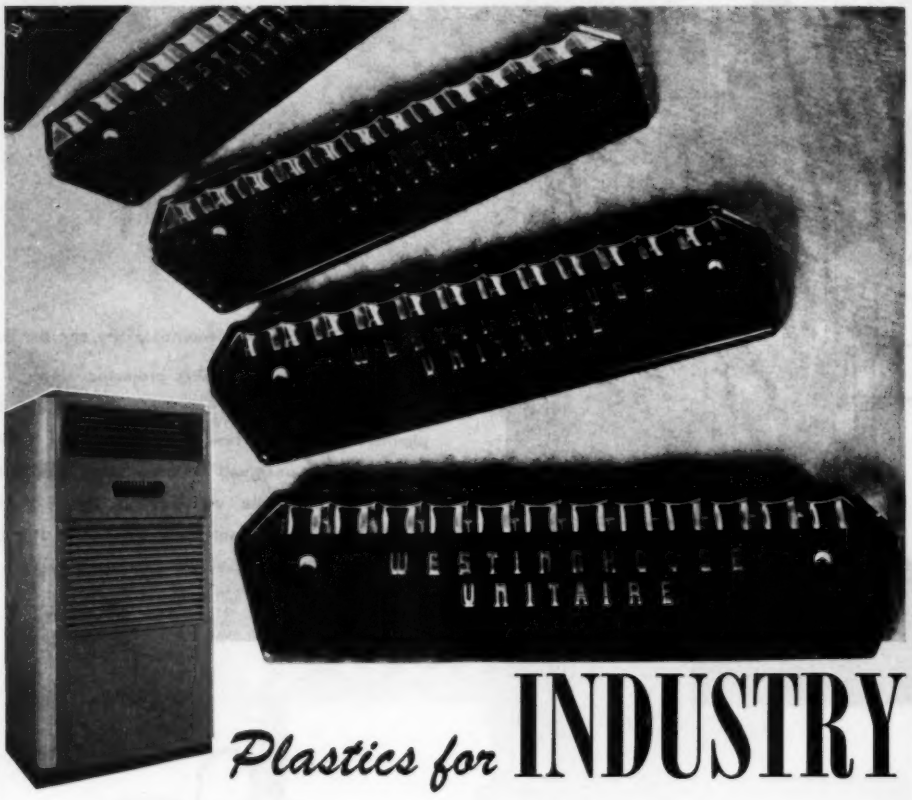
**Dependent upon mold construction and part design*

Klenolyn PRE-PLASTICIZING PROCESS JC JACKSON & CHURCH CO Saginaw Michigan

A PRODUCT OF

JACKSON & CHURCH CO. • SAGINAW, MICHIGAN

WORK WELL DONE SINCE '81



Plastics for INDUSTRY

Pictured above is the lucite nameplate, manufactured by Cruver for the Westinghouse Unitaire air conditioning unit. Actual size is 10-1/4 inches long by 2-3/4 inches wide; decorated by the Cruver Bas-Releef process in bright silver and black.

CRUVER

MANUFACTURING CO.

2460 W. JACKSON BLVD., CHICAGO 12, ILL.

BRANCH OFFICES

DETROIT MINNEAPOLIS NEW YORK

CLEVELAND ST. LOUIS

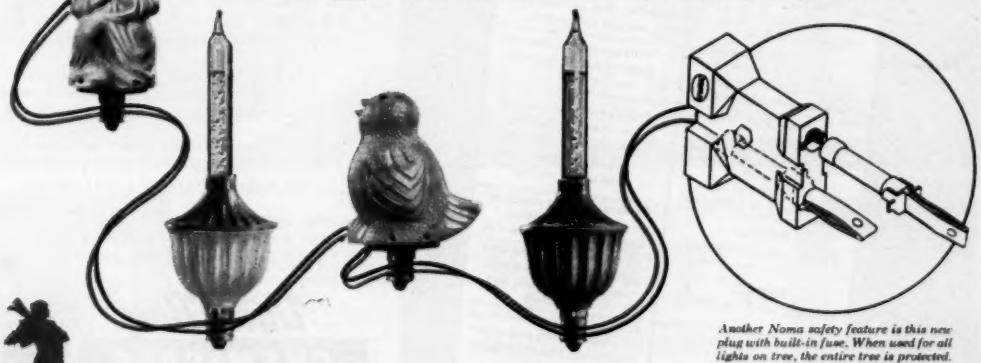
Noma Plays SAFE with Flame-Resistant Hercocel*

A new addition to Noma's distinguished line of Christmas ornaments is the Glo-lite Musical Santa, an animated plastic figure which can be used as a table or mantel lamp, or as a window decoration. The big brass button on Santa's coat winds a spring mechanism operating a Swiss music box. As it plays, Santa rings the bell held in his right hand.

In selecting a plastic for this new product, Noma played safe... chose Hercules® Flame-Resistant Hercocel, the material which has proved itself in more than two years of use in Noma's Bubble-Lites and "Fancy Figures." This unique plastic, pioneered by Hercules, offers all the features of regular acetate, plus the advantage of being a self-extinguishing material which can be injection molded.

Hercules Flame-Resistant Hercocel is bringing added color and sales appeal to a growing list of electrical products. Our technical staff will be glad to help you apply it to your own needs.

HERCULES POWDER COMPANY *Cellulose Products Department, 916 Market Street, Wilmington, Del.*



Another Noma safety feature is this new plug with built-in fuse. When used for all lights on tree, the entire tree is protected.

HERCULES Cellulosic Plastics

*TRADE-MARK

CP51-6

Give your

VINYL PLASTICS

the VALUABLE PROTECTION

of "Dutch Boy" Stabilizers

Choose these for the best electrical insulation compounds

"DUTCH BOY" TRIBASE

Tri-basic Lead Sulphate. Tribase is the most basic lead sulphate available. It has a total lead content equivalent to 90% PbO, which means it affords maximum reactivity with the degradation products of vinyls caused by heat.

It is the quality stabilizer for vinyl insulation. The electrical characteristics and heat stability of vinyl compounds containing Tribase are unsurpassed!

"DUTCH BOY" TRIBASE-E

Basic Lead Silicate Sulphate. Tribase-E was specifically developed to answer the vinyl electrical insulation industry's demand for a stabilizer with exceptional heat stability and good electrical characteristics at low volume cost.

Tribase-E takes advantage of the electrical properties of lead silicates without sacrificing moisture repellency. The safe reactive lead content, together with the absence of any carbonate, eliminates danger of gassing.

"DUTCH BOY" DS-207

Di-basic Lead Stearate. When used with Tribase or Tribase-E, DS-207 improves processing characteristics, water repellent properties and light stability of your vinyl insulation stocks. DS-207 has a double utility when used in Vinyl Plastics. It is an excellent heat and light stabilizer; it is an effective lubricant.

"Dutch Boy" Stabilizers

PRODUCT	USE
TRIBASE (Tribasic Lead Sulphate)	Electrical and other compounds requiring high heat-stability
TRIBASE E (Basic Lead Silicate Sulphate Complex)	Low volume cost insulation
DS-207 (Dibasic Lead Stearate)	Stabilizer-lubricant for sheeting, film, extrusion and molded compounds
PLUMB-O-SIL A (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored sheeting and upholstery stocks
PLUMB-O-SIL B (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored film, sheeting, belting
PLUMB-O-SIL C (Co-precipitate of Lead Orthosilicate and Silica Gel)	Highly translucent film and sheeting
DYTHAL (Di-basic Lead Phthalate)	General purpose stabilizer for heat and light. Good electrical properties
DYPHOS (Di-basic Lead Phosphite)	Outstanding for heat and light in all opaque stocks, including plastisols and organosols
NORMASAL (Normal Lead Salicylate)	As stabilizer or co-stabilizer in vinyl flooring and other compounds requiring good light-stability

"Dutch Boy" Stabilizers—Tribase, Tribase-E, DS-207—impart excellent electrical properties, improved resistance to moisture, increased stability to heat and light aging.

They have maximum reactive lead content; they are widely compatible with other compound ingredients; they're economical.

And—like all "Dutch Boy" products—they're backed up by the solid reputation of the maker—National Lead Company.

Our technical staff will be glad to help you stabilize vinyl resins for any use. Write for complete information.

Dutch Boy* **CHEMICALS**

*Reg. U. S. Pat. Off.

NATIONAL LEAD COMPANY
111 Broadway New York 6, N.Y.

Molds 60 ounces of plastic parts per minute with help of TIMKEN® bearings

THESE five molding machines, shown here in operation at General American Transportation Corporation's East Chicago factory, make up the world's biggest production line for large injection-molded plastic parts. Built by the Hydraulic Press Manufacturing Company, each machine can mold sixty ounces of plastic parts in less than a minute.

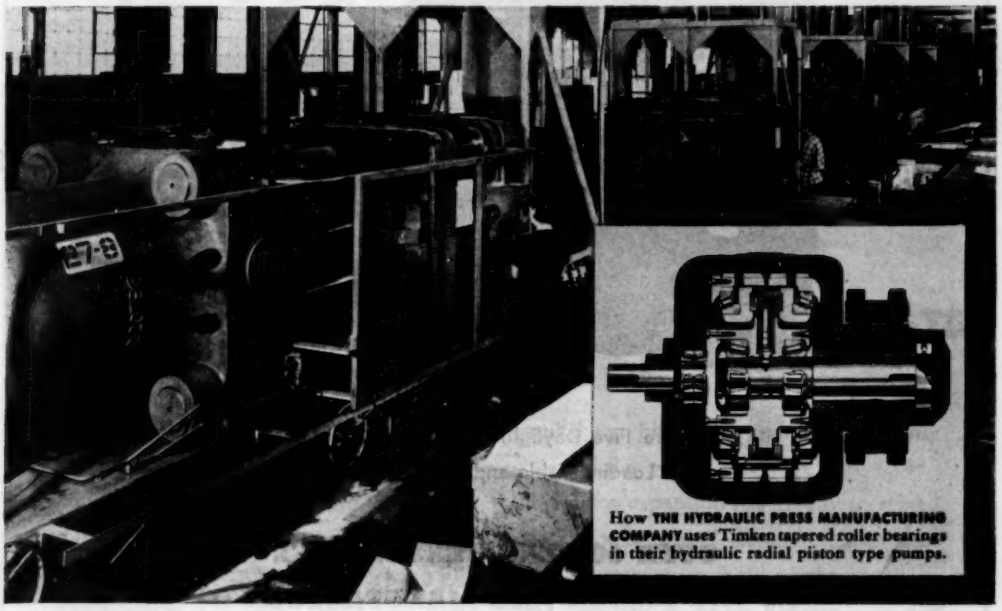
The hydraulic power system is composed of two radial piston pumps per machine. And to keep these pumps on the job with minimum time-out for maintenance and repairs, H-P-M mounted Timken® bearings on the drive shaft, eccentric and rotor.

Timken tapered roller bearings hold shafts in proper alignment, minimizing deflection and preventing end-movement. Wear on moving parts is reduced. Timken bearings have extra load-carrying capacity due to line contact between the rollers and races. Tapered design enables them to take radial and thrust loads or any combination.

Because of incredibly smooth surface finish and true rolling motion, Timken bearings practically eliminate friction. Closures are more effective because Timken bearings keep housing and shaft concentric. Dirt and grit are kept out; lubricant in. And Timken bearings are engineered for the job, precision manufactured, and made of Timken fine alloy steel. So they normally last the life of the machine.

Backed by over fifty years of bearing research and development, Timken bearings are first choice throughout industry. Make sure you have them in all the equipment you build or buy. Always look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How THE HYDRAULIC PRESS MANUFACTURING COMPANY uses Timken tapered roller bearings in their hydraulic radial piston type pumps.

WE MAKE OUR OWN STEEL

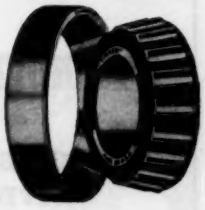
The special grade alloy steel which gives Timken bearings their strength and resistance to wear, is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION ✳

IDDON BROS. LTD.

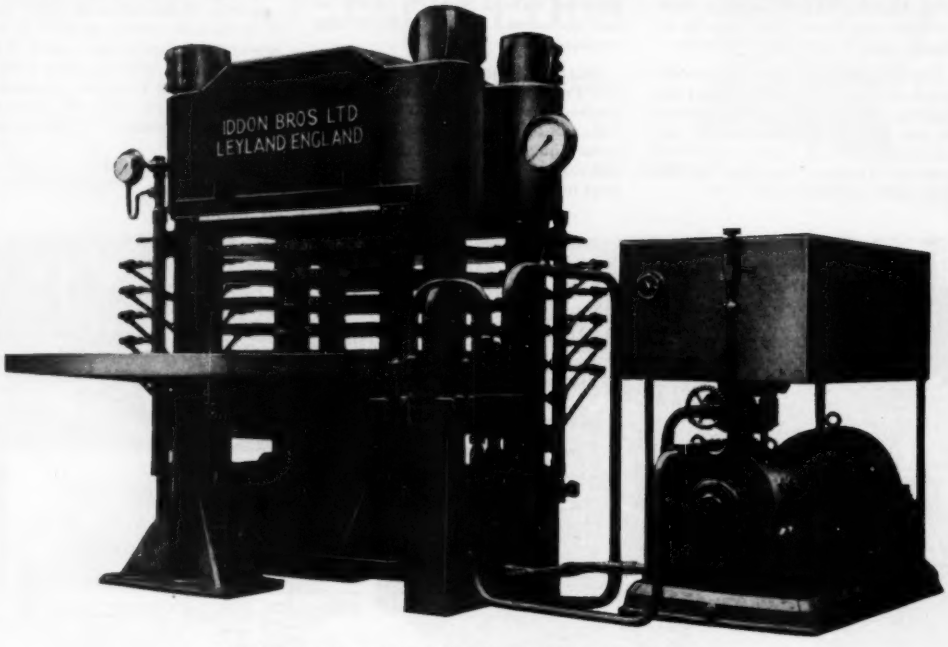
TELEPHONE
LEYLAND-81258/9

LEYLAND, ENGLAND

GRAMS:
'IDDON' LEYLAND

MAKERS OF

MACHINES FOR THE PLASTICS INDUSTRY



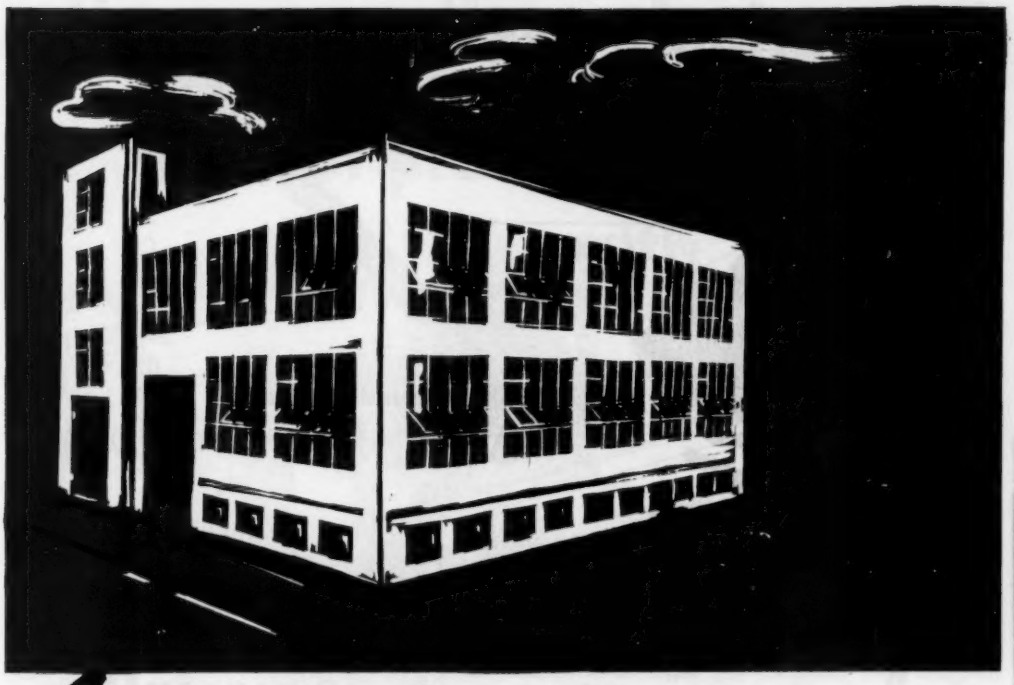
42" Square Five Daylight Press (24" diameter ram)
with Loading Table and Mono-Radial Pump

OVER 60 YEARS EXPERIENCE

IN THE DESIGN AND MANUFACTURE OF

CALENDERS—MILLS—PRESSES—EXTRUDERS—Etc.

ENABLES US TO OFFER A RANGE OF MACHINES WITH A SALES RECORD BUILT ON COMPARISON



Additional Plant Facilities...

TURN OUT BIGGER MOLDS ... AND DO IT FASTER

to serve the customers of Newark Die

The new machine tool facilities of Newark Die Company are housed in a modern building that is designed throughout for the efficient handling of molds in *really* big sizes. Floors are constructed to withstand heavy loads. Overhead cranes and other up-to-the-minute materials handling equipment keep big molds moving smoothly through the plant.

This plant expansion has greatly increased our ability to provide prompter, more economical service on molds, hobs and hobbed cavities — *with even greater accuracies than ever before.*

some steels
are pampered pets
These are the special purpose steels that set Crucible apart from most other steel companies. For these special steels must be carefully compounded, and so sensitively handled that, in most cases, they cannot be mass produced.
Such steels include those designed for use under severe conditions of heat or cold, stress, strain, or wear. For example: Crucible high-speed tool steels are in the whirring machines that cut and shape the toughest metals; Crucible hollow drill steels work around-the-clock digging mines and quarries, and Crucible stainless steels put a sparkle with a purpose in our kitchens.
If you have an application that calls for a special steel, Crucible's metallurgical staff stands ready to help you.
CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.
CRUCIBLE
first name in special purpose steels
51 years of Fine steelmaking

You saw this ad in the Saturday Evening Post, Time, Newsweek, Business Week

especially tool steels!

Crucible Tool Steels have been pampered pets every day of the 51 years Crucible has led in this highly specialized field. That's why tool steel users, assured of getting what they want from Crucible, have kept us the country's number one tool steel producer.

Since Industry is constantly opening new fields that require new tool steels, Crucible's interest in their further development and improvement goes on unabated. You can profit from the wealth of knowledge gained by Crucible in the application of these steels to thousands of uses. The unparalleled experience of our metallurgists is freely available to you.

That's why it pays to get *all* your tool steel requirements from Crucible.

write for your selector today

If you haven't gotten your handy tool for selecting tool steels, write: Dept. MO, Crucible Steel Company of America, 405 Lexington Avenue, New York 17, New York

3 colors, 9" diameter

CRUCIBLE first name in special purpose steels

51 years of Fine steelmaking **TOOL STEELS**

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DENVER • DETROIT HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH • PROVIDENCE • ROCKFORD SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

Save resin–Save plasticizer protect product quality

–with PLIOVIC

Laboratory tests prove that PLIOVIC *reduces consumption of scarce plasticizer without effect on modulus, tensile or hardness of product.*

You can prove – right in your own laboratory – that you'll save on resin *and* save from 10% to 15% on scarce, costly plasticizer by using PLIOVIC – Goodyear's vinyl chloride copolymer. That's because of the more efficient internal plasticizing action of PLIOVIC.

Using this use-proved resin will give you strength, hardness and flexibility –let you load with extender pigments with little sacrifice of physical properties—and use faster mixing at lower temperatures. With all these advantages, you'll get products that are comparable to those you are now getting with other resins requiring the use of larger quantities of costly plasticizer.

PLIOVIC is currently in use in calendered films, sheeting and flooring and in extruded hose and tubing. Ask for full details about PLIOVIC in any of its forms – PLIOVIC A and AR for general purposes and PLIOVIC AO for organosols. You can get full information and samples by writing:

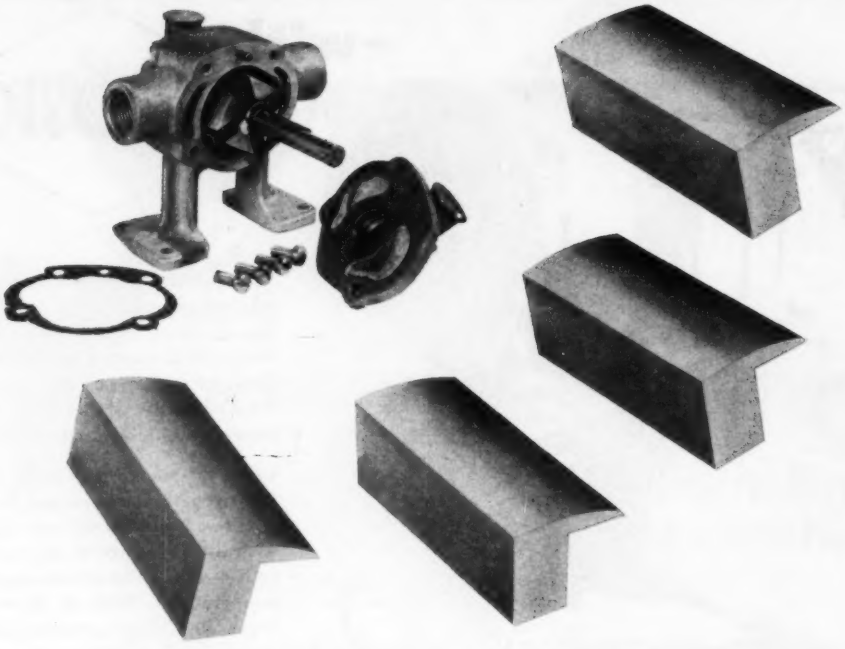
Goodyear, Chemical Division
Akron 16, Ohio

GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

Pliovic—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

SERVING INDUSTRY!



Through the use of the injection molded nylon pump vanes, pictured above, the life and efficiency of a good industrial pump was decisively improved.

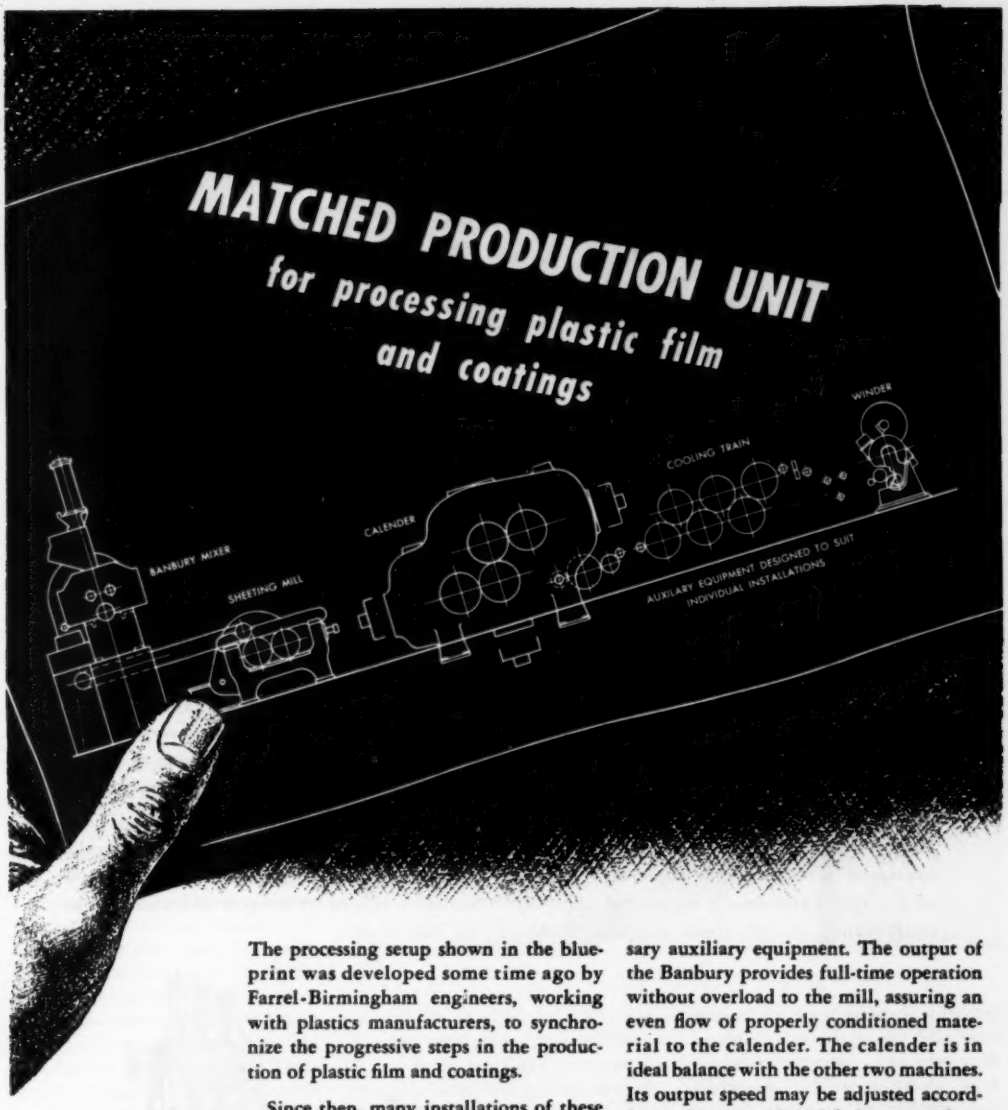
Can your product be improved through the use of the correct plastic and the complete services of a skilled injection molder?

For your file reference — send for our latest booklet covering our manufacturing facilities and descriptions of typical products.

INJECTION MOLDING
MINCOR
YOUR PLASTICS DEPARTMENT

MINNESOTA PLASTICS CORP.

366 WACOUTA • ST. PAUL 1, MINN.



Farrel-Birmingham engineers will be glad to help you select individual machines or combination units best suited for your specific requirements.

The processing setup shown in the blueprint was developed some time ago by Farrel-Birmingham engineers, working with plastics manufacturers, to synchronize the progressive steps in the production of plastic film and coatings.

Since then, many installations of these *Matched Production Units* have been made in plastics plants. In fact, the combination has given such satisfactory service that it has become the generally accepted unit for this type of production.

The unit shown consists of a size 3A Banbury mixer, a 22" x 60" mill, a 28" x 66" four-roll, Z-type calender and the necessary auxiliary equipment. The output of the Banbury provides full-time operation without overload to the mill, assuring an even flow of properly conditioned material to the calender. The calender is in ideal balance with the other two machines. Its output speed may be adjusted according to the gauge of stock being run. Where greater or lesser output than is provided by this setup is required, larger or smaller machines with matched capacities are available.

FARREL-BIRMINGHAM CO., INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham®

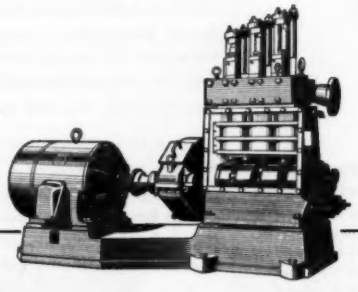
FB-668

more horse-power per pound

Famous for stamina and a sure foot, the burro was a hard-working "pardner" of the old-time prospector. He's a little fellow—but he packs more horse-power per pound than any of his four-footed cousins . . .

This ability to get more work done with fewer pounds to do it is precisely what Aldrich Direct Flow Pumps have to offer. As a result of improved design, weight of the fluid-end is considerably reduced. And—whereas a speed of 150 rpm was formerly considered high for reciprocating pumps—these compact, Direct Flow units are operating today at speeds of 500 rpm for the 3″; 360 rpm for the 5″; and 300 rpm for the 6″ stroke. In each case, you get greater volume and higher pressure from a smaller pump: *you get more horse-power per pound.*

Applications for Aldrich Direct Flow Pumps include: molding, extruding and other operations requiring hydraulic pressure. . . . Aldrich designs and furnishes *complete* central hydraulic systems—incorporating Aldrich Pumps, accumulators, alleviators and control systems. Write for Data Sheets.



THE ALDRICH PUMP COMPANY

6 GORDON STREET • ALLENTOWN, PENNSYLVANIA

...Originators of the Direct Flow Pump

Representatives: Birmingham • Bolivar, N. Y. • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Denver • Detroit
Duluth • Houston • Jacksonville • Los Angeles • New York • Omaha • Philadelphia • Pittsburgh • Portland, Ore.
Richmond, Va. • St. Louis • San Francisco • Seattle • Spokane, Wash. • Syracuse • Tulsa • Export Dept.: 751 Drexel Building, Phila. 6, Pa.

Design + Koppers Polystyrene = Utility

● Amazingly careful design made this ScotTowel holder just what the housewife wanted—a neat, colorful and mechanically-practical household fitting. Scott design engineers found that Koppers Polystyrene had a unique combination of qualities that could be utilized. Durable, attractive color and finish were basic, but most important were the inherent physical properties of "Koppers 81" which produced a strong holder whose resiliency eliminated the need for separate metal springs. Tests showed satisfactory performance for years of normal use. Further, the new plastic holder was vastly superior to the old metal model which it replaced.

In manufacturing, Koppers Polystyrene 81 resulted in quick, economical production. Easy moldability made fast molding cycles possible and produced few rejects, and dimensional stability assured parts that fit together as designed.

Technical data on the molding characteristics of Koppers Polystyrenes are available upon request. As always, we want to work with you to obtain the best results from your use of Polystyrene . . . to solve your particular molding problems (with special attention to military end uses) . . . and to design new products to be made from Koppers Polystyrene when the supply situation again becomes more normal.

KOPPERS

Koppers Plastics have made Many Products Better and Many Better Products Possible.

[redacted]

KOPPERS COMPANY, INC., Chemical Division, PITTSBURGH 19, PA.

SALES OFFICES: NEW YORK · BOSTON · PHILADELPHIA · CHICAGO · DETROIT · LOS ANGELES

Pencil drawing directly on Stabilene 147

A Contact printing from [illegible] original on aluminum at North American Aviation, Inc.

The vital role of Vitron glass fibers in defense production accuracy

Stabilene glass tracing cloth revolutionizes production methods*

"Draw it once" was an idea without a material until Keuffel and Esser developed Stabilene Glass Tracing Cloth. Stabilene—made from highly transparent, dimensionally stable VITRON Glass Yarns —now slashes drawing and photo template costs, and brings about greater accuracy between engineering and production.

Dimensional drawings are eliminated by the Stabilene method. A full scale layout on the glass cloth sheet is contact printed directly on the template material. Extra drawings are simply printed with absolute accuracy on sensitized Stabilene Glass Tracing Cloth.

VITRON Glass Yarns are used to weave Stabilene Cloth, because they produce a more uniform cloth than any other glass weaving material—a result of exacting quality control during the exclusive Glass Fibers electronic-extrusion process.

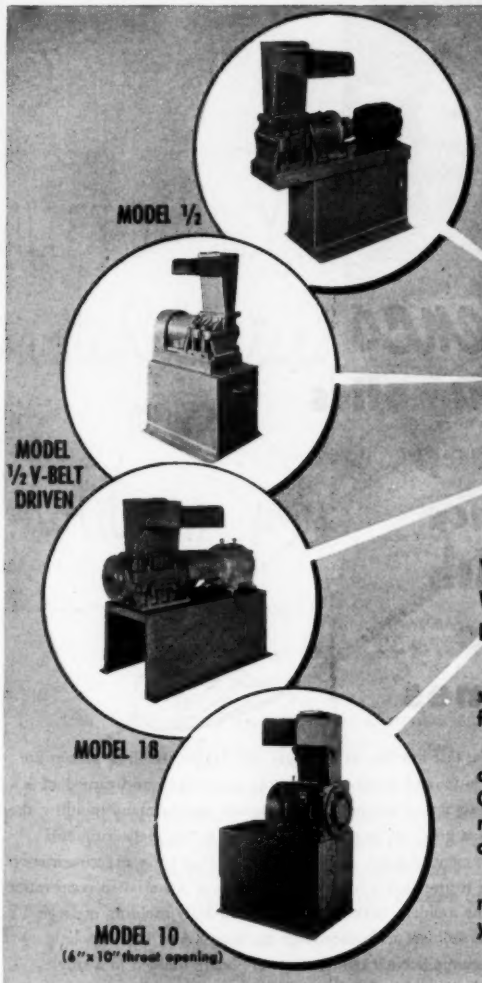
Do you have a problem that may be solved by the outstanding functional properties of VITRON? We'll be glad to supply names of intermediate processors and discuss details with you.

*Stabilene is a K & E Trademark.

Vitron®

PLASTIC REINFORCING MATERIALS

GLASS FIBERS INC. 1810 Madison Avenue • Toledo 2, Ohio



There's a

CUMBERLAND GRANULATOR

that's *RIGHT FOR YOU!*

YOU'LL G… …CALLY WITH A CU… …THAT'S BUILT-FOR-THE-JOB.

Each granulating job in your plant has its own specific problems. Only a granulator that's built-for-the-job can do the job most efficiently.

Whether you granulate combs or television cabinets, brittle or elastomeric materials, there's a Cumberland granulator designed to meet your needs. Each machine is easy to operate, easy to clean, and extremely rugged.

We'll be glad to help you analyze your needs and recommend the granulator that's exactly right for you!

For more information, write for Bulletin 250.

OTHER CUMBERLAND MACHINES

NEW PREBREAKER

Cuts up radio, television cabinets and other large parts. Two machines available: Model 32 (20" x 32" throat opening); Model 24 (10" x 24" throat opening). Write for details.

ROTARY CHOPPING MACHINE

Heavy duty, rugged machine. Used for cutting thick vinylite slabs from two roll mills. Also used as large capacity pelletizer. Other applications are described in Bulletin 400.

PELLETIZING MACHINE

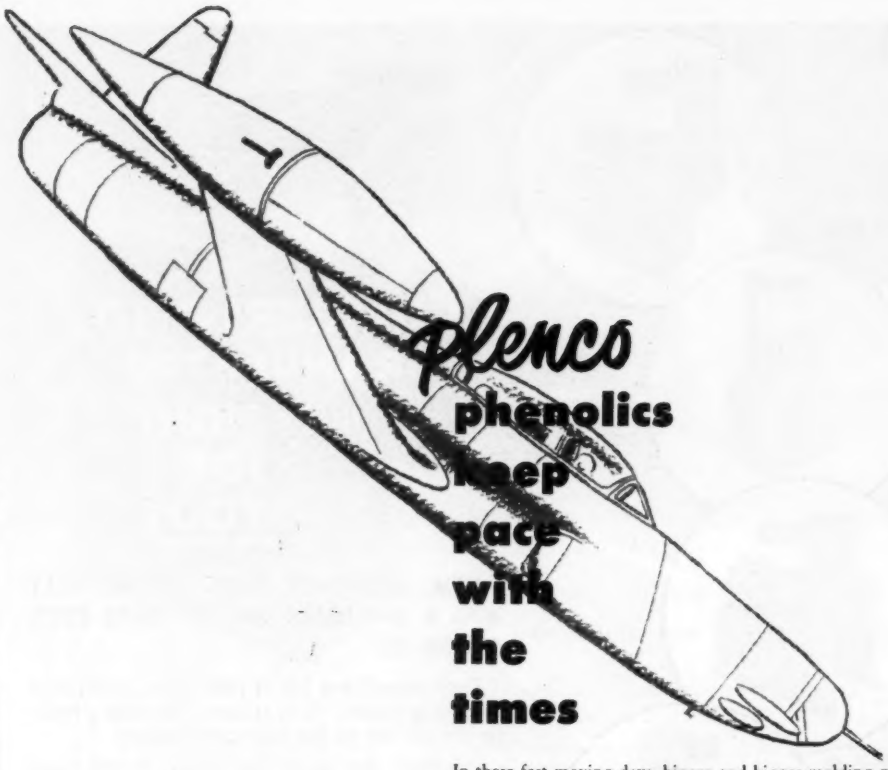
Smaller, companion model to Rotary Chopper. Designed specifically for use with continuous extruders. Gives efficient, trouble-free performance. Write for complete details.

CUMBERLAND Engineering Company Inc.

BUILDERS OF BETTER MACHINES FOR THE PLASTICS INDUSTRY

DEPT. I · BOX 216 · PROVIDENCE · RHODE ISLAND

California Representative:
WEST COAST PLASTICS DISTRIBUTORS, INC.
2325 Jesse Street, Los Angeles 33, Cal.



Plenco phenolics keep pace with the times

In these fast moving days, bigger and bigger molding presses are being built and *giant* size phenolic castings — undreamed of a few years ago — are now commonplace jobs in many molding shops. Plenco is proud of having played a part in the pioneering and development of giant size moldings. During early experimentation, Plenco formulated a long-flowing phenolic material in cooperation with the molders, making possible deep-draw molding of large TV console cabinets and other large moldings. And that was only the beginning. Now two cabinets are being molded in a single press closing with the ease and precision of small parts.

Keeping pace with the times is a definite part of our program. Constant research and attention to the varying problems which arise is just as important as the production of good quality phenolic molding compounds and uninterrupted satisfactory service to molders everywhere.

Phenolic users who have difficult material problems know they can turn to Plenco for sound solutions. With the multitude of standard grade Plenco Phenolics available, we can help you determine the ideal formulation for your job. If the parts you are molding require impact or dielectric strength, good flow properties, or other special characteristics, chances are Plenco has a material to suit your needs. Just write and tell us about your requirements.

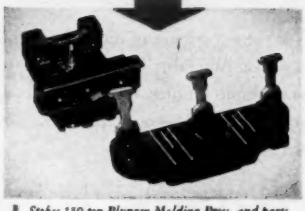
PLASTICS ENGINEERING CO.

Sheboygan, Wisconsin

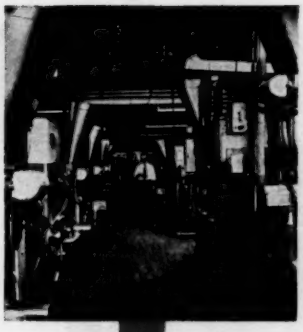
PLENCO PHENOLICS

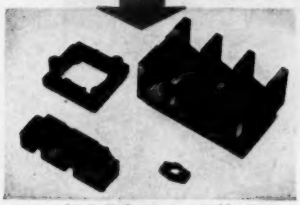
. . . black, browns, mottles and colors in General Purpose, Heat Resisting and Medium Impact grades. Special Purpose Molding Compounds and Resins are produced to fulfill special molding requirements.

ALLEN BRADLEY...
switch-hitters on molding jobs



Stokes 150-ton Plunger Molding Press, and parts (one including inserts) made on this press





Battery of Stokes Fully Automatic Molding Presses, 15 and 50-ton, and typical parts produced

When Allen-Bradley of Milwaukee needs parts with adjoining thick and thin sections or parts requiring inserts they use Stokes plunger molding presses.

When they need a volume of smaller parts adapted to automatic production, they switch to fully automatic Stokes machines.

Both these types of Stokes machines have a considerable range of flexibility. You can produce anything on a plunger molding press that you can on a fully automatic but you require a man at each plunger press to load and unload for every cycle. For the parts that require no attention after set-up the fully automatic is ideal . . . one unskilled man can run a dozen or more automatics.

Either of these Stokes machines produces superbly finished quality parts.

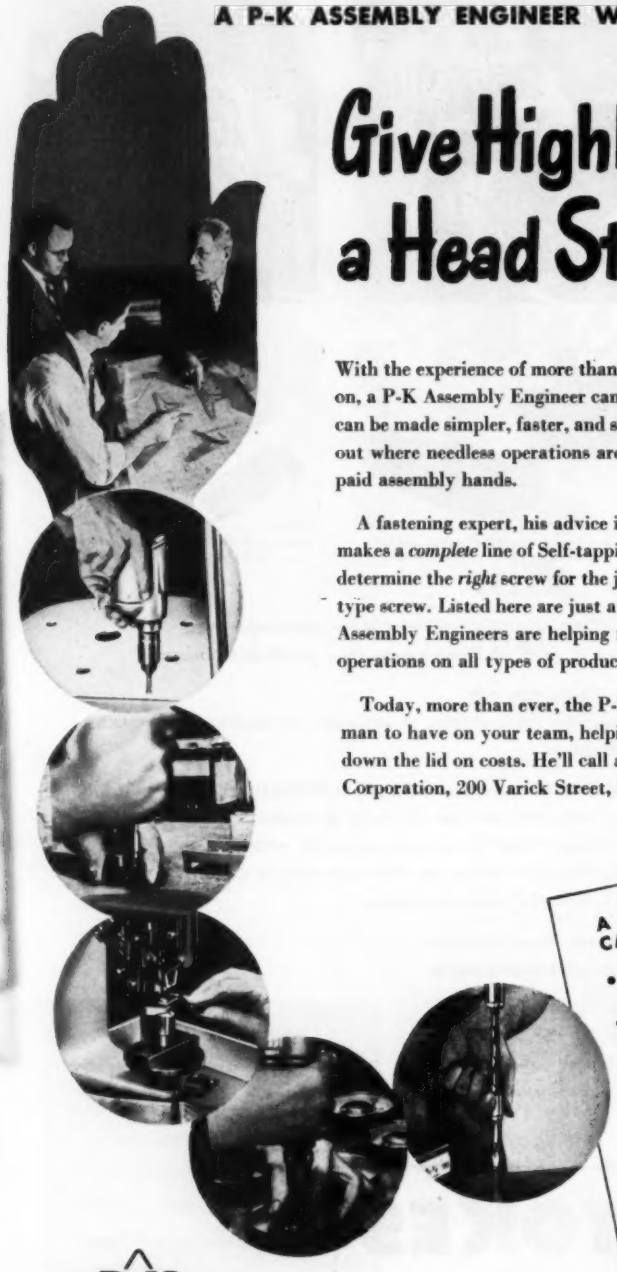
Allen-Bradley finds it profitable to have both types. Many manufacturers would profit by the same plan, especially as the Stokes plunger molding press is easily converted to compression molding.

STOKES

F. J. STOKES MACHINE COMPANY, 5000 TABOR ROAD, PHILADELPHIA 20, PA.

A P-K ASSEMBLY ENGINEER WILL HELP YOU

Give Highly Paid Hands a Head Start . . .



With the experience of more than a million applications to draw on, a P-K Assembly Engineer can quickly spot the fastenings that can be made simpler, faster, and stronger. He'll help you find out where needless operations are slowing up your highly paid assembly hands.

A fastening expert, his advice is unbiased. Since Parker-Kalon makes a *complete* line of Self-tapping Screws, his purpose is to determine the *right* screw for the job, *not* to fit the job to a certain type screw. Listed here are just a few of the many ways P-K Assembly Engineers are helping manufacturers speed fastening operations on all types of products.

Today, more than ever, the P-K Assembly Engineer is a good man to have on your team, helping you boost production and hold down the lid on costs. He'll call at your request. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

A P-K ASSEMBLY ENGINEER CAN SHOW YOU . . .

- How assemblies can be made with fewer fastenings.
- Where standard screws can be used instead of specials.
- How to use available types instead of those in short supply.
- Where to use power drivers for added speed.
- Where various head styles can be used to advantage.
- How to save time in selecting and ordering screws.
- How to save time in training new assembly help.

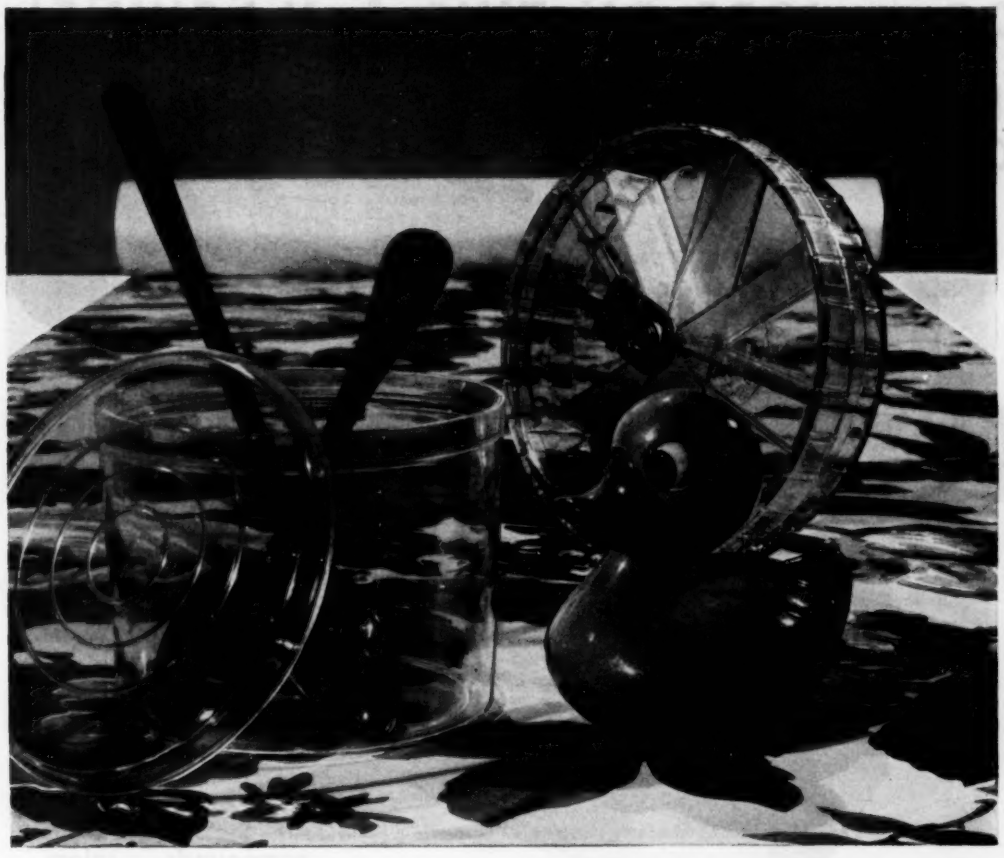
WHAT IS YOUR FASTENING PROBLEM?

IF IT'S P-K IT'S O.K.

The Original

PARKER-KALON® SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY



SANTICIZER 8 An Available Plasticizer for Molded Plastics...Coatings...Adhesives

Here's a plasticizer of diversified application you can get *right now* from Monsanto. Santicizer 8 is a mixture of N-ethyl ortho and para toluene sulfonamides. Check these facts about the use of Santicizer 8:

In Molded Plastics: One of the leading plasticizers for nylon. Imparts high tensile strength, brilliance and polish, elongation and flexibility to cellulose acetate sheeting and film. Practically insoluble in hydrocarbons, giving outstanding service in products that must withstand gasoline and oil.

In Coatings: Highly compatible with nitrocellulose lacquers; gives excellent brilliance and gloss, flexibility, moisture resistance and adhesion. Compatible with proteins and with zein and casein coatings to at least 50% by weight, improving flexibility, water resistance, gloss and adhesion. An excellent dye solvent, it enhances the brilliance of oil-soluble colors.

In Adhesives: A first-rate plasticizer for use in hot-melt adhesives. Particularly useful for imparting tack and adhesion to polyvinyl acetate and polyvinyl butyral resins. Adds adhesive qualities to lacquers and coatings.

A sample, technical assistance in formulating, or further information about Santicizer 8 is yours for the asking. Write the nearest Monsanto Sales Office or MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

Santicizer: Reg. U. S. Pat. Off.

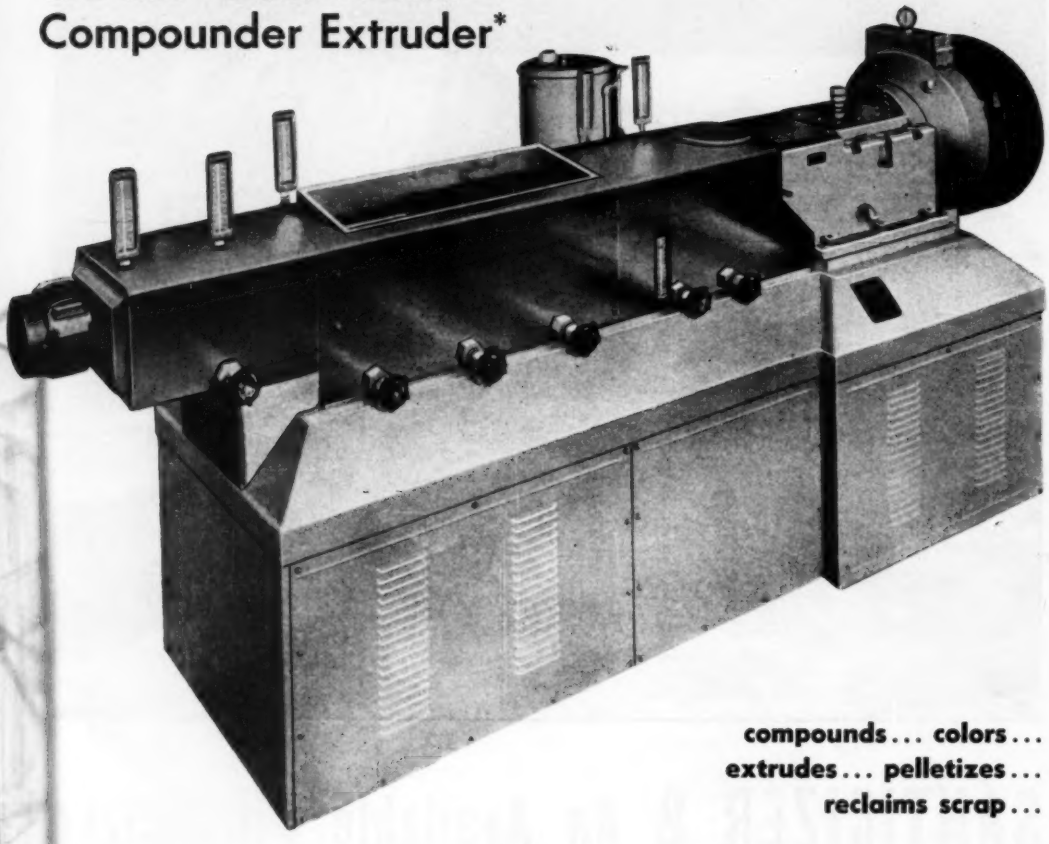
DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

DO 5 JOBS ON THIS 1 MACHINE!

It's the "Dual Worm" Compounder Extruder*



compounds... colors...
extrudes... pelletizes...
reclaims scrap...

HERE is an extruding machine to slash your production costs by doing the work of five separate kinds of equipment.

The patented interacting "Dual Worms" that operate in a "pressurized" cylinder provide the explanation. They generate so much power, work so fast and knead so thoroughly that they're able to perform functions beyond the capacity of most conventional extruders.

Operation of the machine is simple and almost entirely automatic except for feeding raw materials or scrap into the hopper.

The "Dual Worm" Compounder Extruder is available with 2" worms—output approximately 100 pounds per hour. Larger, higher capacity units are in prospect.

Write today for prices and free descriptive brochure.

SMART & BROWN (Machine Tools) LTD.

24, 25, Manchester Square, London W. 1, England

Telephone: Welbeck 7941 Cables: Smartool, Wesdo, London

* By agreement with Messrs. WELDING ENGINEERS, Norristown, Pennsylvania, U.S.A., Smart & Brown (Machine Tools) Ltd. are the licensed manufacturers in England of 2" "Dual Worm" Compounder Extruders. They are also the sole distributors for all countries except North America. Local agents are being appointed.

MPS-500

some things you will want to know about this new low-cost vinyl plasticizer

what it is

MPS-500 is a stabilized, chlorinated ester of a fatty acid, in which the chlorine content is controlled to give best balance between compatibility and plasticizing efficiency.

its chief advantages

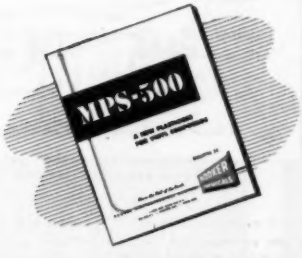
MPS-500 is lower in cost than most primary plasticizers. It shows excellent compatibility with vinyl chloride polymers and copolymers, is highly permanent and flame retardant.

qualities it can impart to your product

- Flame retardance
- High resistance to water, oil, gasoline
- High permanence on heating
- Excellent electrical properties
- High tensile strength at high flexibility
- Low migration

what you can use it for

- Transparent and opaque films
- Upholstery and drapery
- Shoe soles
- Electrical insulation
- Hose covering
- Organisol and Plastisol formulations
- Softener for nitrile rubbers



BULLETIN 35 gives you properties of MPS-500; comparisons with other plasticizers; detailed test data; typical formulations and uses. Write today, on your company letterhead, for a copy.

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

18 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.
NEW YORK, N. Y. • WILMINGTON, CALIF. • TACOMA, WASH.

HOOKER CHEMICALS

1-865

BENZOIC ACID • CHLOROTOLUENE • SODIUM BENZOATE • CAUSTIC SODA • MURIATIC ACID • CHLORINATED PARAFFIN • CHLORINE

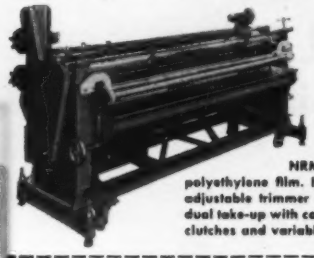
NRM THERMOPLASTICS FILM EXTRUSION EQUIPMENT

for producing film, tubing, and sheeting for packaging

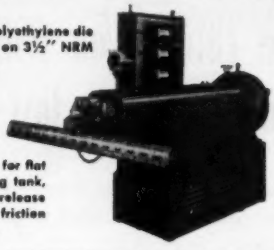
All NRM extruders can be equipped with dies and haul-offs for the extrusion of P.V.C. and polyethylene film and thin-wall expanded tubing.

NRM Haul-off and Wind-up units cool, trim, and wind up polyethylene film at a rate of 250 to 300 pounds per hour . . . have a thickness range of .001" to .010" and can maintain tolerances of plus or minus 5/10%. They are available in 48" and 72" sizes.

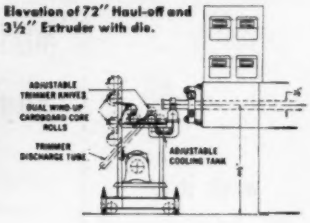
Haul-off and Wind-up sections are powered by a variable speed drive to suit the size of extruder used in connection with the machine. Dies for polyethylene film used with this take-up fit all sizes of extruders and are available complete with heaters and controls.



NRM 72" Haul-off for flat polyethylene film. Includes cooling tank, adjustable trimmer knives, quick release dual take-up with constant tension friction clutches and variable speed drive.

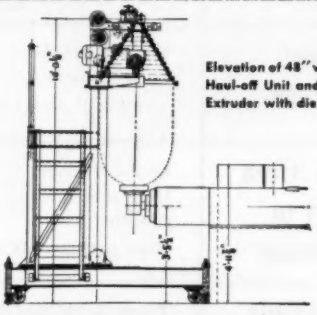


T-type polyethylene die mounted on 3½" NRM extruder.

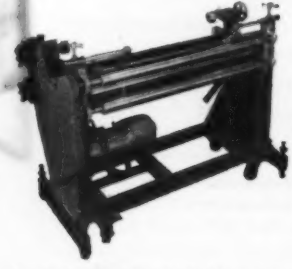


Elevation of 72" Haul-off and 3½" Extruder with die.

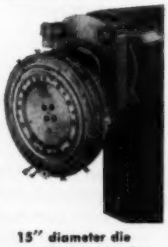
NRM 48" vertical Haul-off for thin-wall expanded P.V.C. and polyethylene tubing. Has variable speed drive, including flattening roll arrangement, adjustable trimmer knives and dual take-up.



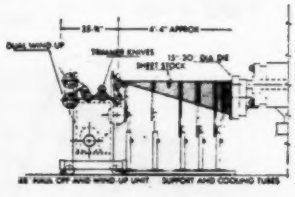
Elevation of 48" vertical Haul-off Unit and 3½" Extruder with die.



NRM 48" Haul-off for P.V.C. sheeting. Includes two water-cooled receiver rolls, adjustable trimmer knives, quick release dual take-up with constant-tension friction clutches, and variable speed drive.



15" diameter die attached to extruder.



Elevation of 48" Haul-off for heavy-gauge P.V.C. sheeting.

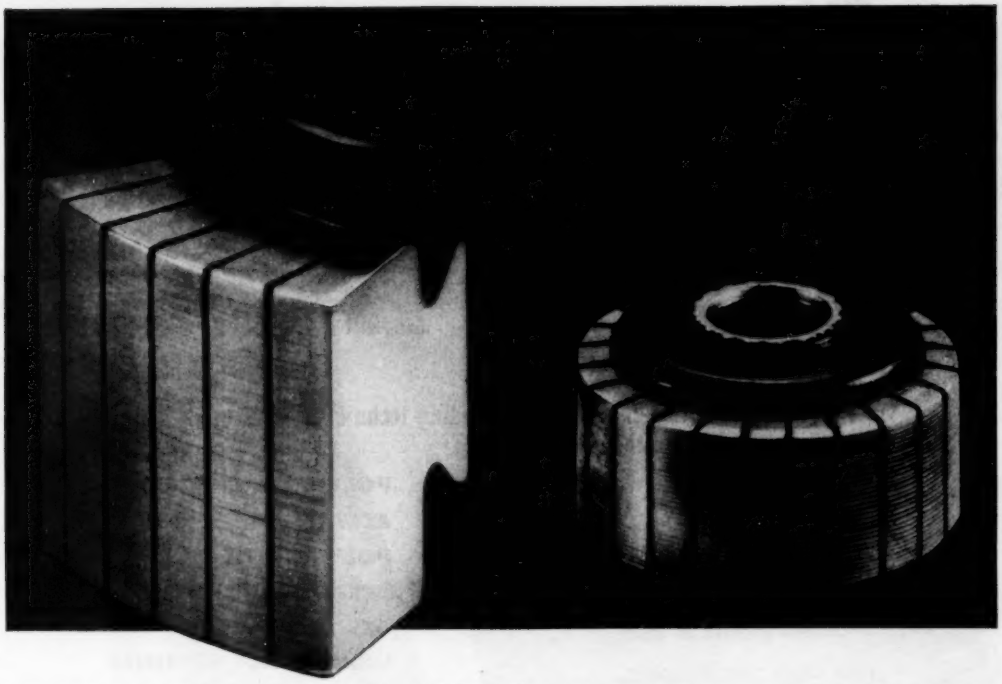
The first machine to extrude heavy-gauge polyvinylchloride sheeting (.005" to .015", and a possible .020") produces sheeting with physical quality equal or better than that of sheeting produced by calenders.

Cost of a complete unit is much less than cost of a calender installation. The economy of the extruder can best be realized on applications where high speed and close tolerances are not imperative.

NATIONAL RUBBER MACHINERY CO. General Offices & Engineering Laboratories Akron 8, Ohio

PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.
AGENTS East: National Rubber Machinery Co., Clifton, N. J.
West: S. M. Kipp, Box 441, Pasadena 18, Calif.
EXPORT Plastics Machinery: OMNI EXPORT CORPORATION
460 4th Ave., New York 16, N. Y.

Creative Engineering



YOUR ANSWER TO HIGH-VOLTAGE PROBLEMS IN PHENOLICS!

Switch to Borden's DURITE.

At your service are Borden engineers to specially compound DURITE to embody any of your special requirements.

Suppose you need electric motor parts like those above. The special requirements were severe . . . high dielectric strength (even at elevated temperatures) and heat resistance, to meet Gov't Specification MIL-P-14A (NFG) . . . moisture-and-oil-resistance . . . high impact-and-tensile-strength . . . minimum shrinkage to easily accommodate inserts built into these parts. RESULT: Borden's DURITE HR350 . . . a perfect blending of these vital features.

In DURITE, Borden gives you the special properties you need, in the degree you want, by skillful combining of cellulosic, carbonaceous and mineral fillers with the resin base. Be sure to address your molding problems requiring Phenolic Molding Compounds to The Borden Company, Chemical Division, Dept. MP-111, 350 Madison Ave., New York 17, N.Y.

Borden's DURITE

Molding Powders • Bonding Resins • Cements

Improved impact coupled with good heat resistance are special properties of the Borden's DURITE phenolic used in this diamond wheel core.

Smooth finish, toughness, dimensional stability are special properties of the Borden's DURITE phenolic used in this reel.

Highest impact, good finish, uniform density are special properties of the Borden's DURITE phenolic used in this gun grip.

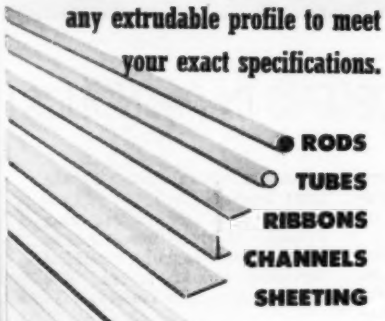
Challenge Clopay Plastics to do your job!

Clopay research has made revolutionary progress in the development of precision plastics with material characteristics of the widest versatility.

Clopay facilities and new compounding techniques offer new opportunities in the engineering of

POLYVINYL CHLORIDE
ACETATE
POLYSTYRENE
ACETATE-BUTYRATE
ACRYLICS
HIGH-IMPACT STYRENES
HIGH STYRENE COPOLYMERS

Thermoplastics in any extrudable profile to meet your exact specifications.



RODS
TUBES
RIBBONS
CHANNELS
SHEETING

Round, flat or unusual shapes in a complete range of colors . . . low and high temperature properties . . . hard or soft with required degree of toughness and dielectric strength to meet the most exacting specifications . . . any combination to satisfy difficult requirements for gaskets, mouldings, tubing, electrical insulation and other uses. Clopay Vinyl extrusions are an authentic improvement over rubbers (natural or synthetic) not a substitute.

CHECK THESE CLOPAY SERVICES

☐ **1.** Fabrication of Vinyl film, supported and unsupported, and Polyethylene film for specialized uses.

☐ **2.** Vinyl coating and embossing of papers and textiles.

☐ **3.** Multi-color printing (surface and rotogravure) for decorative uses and military wrapping and packaging.

☐ **4.** Manufacture of Vinyl Inks.

☐ **5.** Precision fabrication of extruded and molded parts.

☐ **6.** Precision slitting, electric-eye controlled cutting, die-cutting, electronic and thermal sealing, and high speed production line sewing of plastics.

☐ **7.** Manufacture of cast Vinyl film for applications where uniform high strength and dielectric properties are required.

☐ **8.** Complete Laboratory and Engineering facilities for research and development.

For specific information write, wire, or phone . . .
INDUSTRIAL PRODUCTS DIVISION

CLOPAY corporation

Clopay Square, Cincinnati 14, Ohio, DUnbar 4800

New York: 386 Fourth Avenue, Rm. 608—Murray Hill 3-8066
Chicago: 30 N. LaSalle Street—CEntral 6-4418
Cleveland: 428 Union Building, 1836 Euclid—MAin 1-4381
Detroit: 814 Fisher Building—TRinity 1-4262
St. Louis: 4256 Maryland Avenue, Rm. 204—Jefferson 6369

PORTRAIT OF A BRITISH TOOL-MAKER

Never mind the machine (for the moment). Concentrate on the man who's operating it. He's only 38, but that means twenty-four years' continuous experience in British plastics engineering. He's good.

Like him to work for *you?* The machine he's handling (a Keller die-sinking machine) is just one item in a tool-shop as modern in equipment and organisation as any in the Western World. The company he works for* banks its reputation on *accuracy and know-how.* It makes tools for every kind of plastics molding, for export to many countries throughout the world.

A good steel mold is a key asset in your business, standing for an important sum of money. So long as that money's well spent, a short sea journey is neither here nor there.

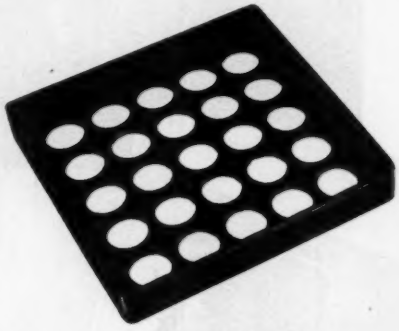
* B.I.P. TOOLS LIMITED

TYBURN ROAD, ERDINGTON, BIRMINGHAM 24, ENGLAND

Cables: PLASMOULD BIRMINGHAM ENGLAND

B·I·P GROUP

RUGGED TOTE TRAY *Cradles* PRECISION PARTS THROUGH PRODUCTION



MOLDED OF ROGERS CORPORATION PHENOLIC

FOR SARGENT & CO.
BY TEAL MOLDING CO., INC.

Better Parts for Better Products

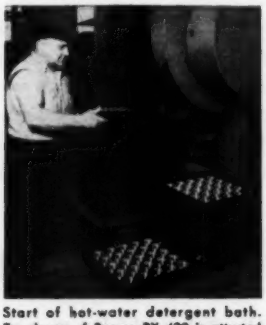
ROGERS
CORPORATION
Established in 1832

This tote tray, molded of Rogers RX 429, an impact phenolic molding compound, gets slammed around . . . immersed in hot water . . . exposed to steam blasts. Frequently, it's on the bottom of a stack of similar trays totalling 1122 pounds of parts.

Sargent uses these trays to carry precision brass parts with external threads which must be protected. RX 429 was specified because it could take the harsh treatment and yet not nick the threads. Teal Molding Company, Inc. approved this choice of material because it can be automatically preformed, has a fast rate of cure, and is clean and dustless.

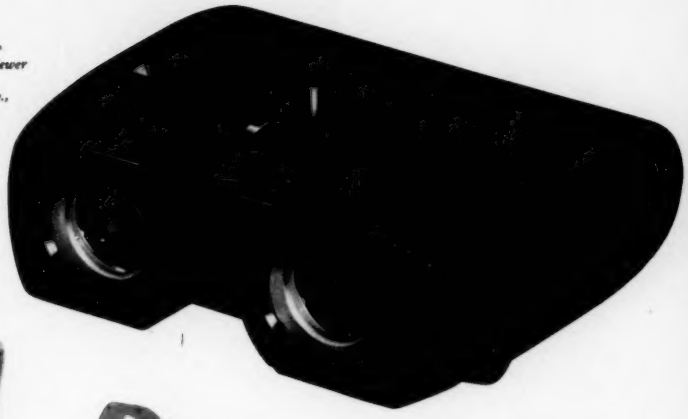
Perhaps you have a problem requiring a high strength material. Our phenolics have demonstrated repeatedly that high strength parts can be obtained at low unit cost. For more details on our materials, please write to Dept. P, Rogers Corporation, Manchester, Conn.

Trays nest compactly and securely, simplifying handling during secondary machining operations. Trays stand up to repeated stacking and unstacking without chipping, cracking or breaking.

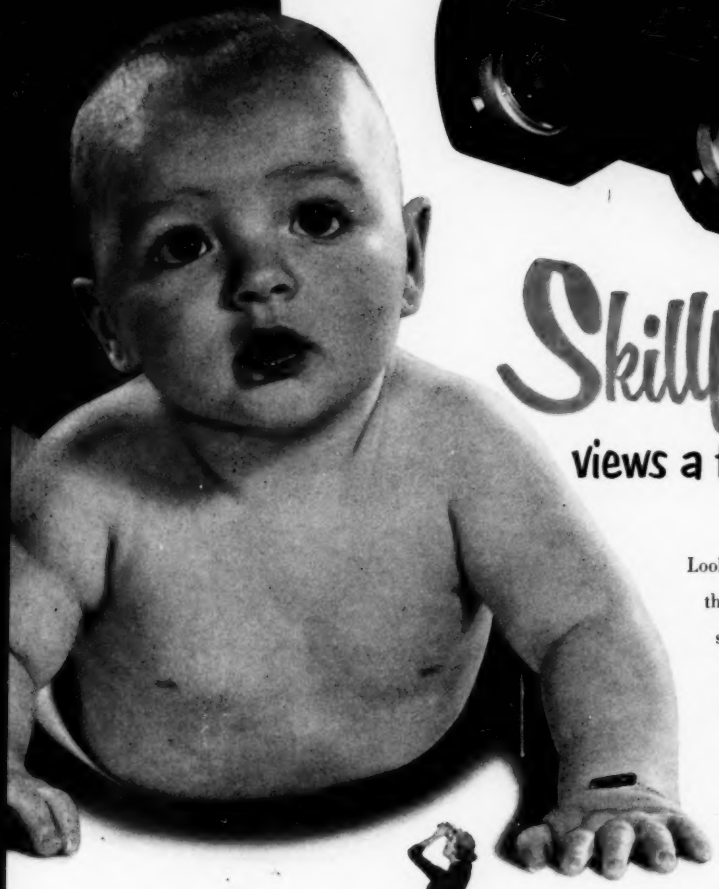


Start of hot-water detergent bath. Toughness of Rogers RX 429 is attested by the fact that trays go unscathed through repeated washing operation.

Note how compactness and strength of trays reduces storage space required for parts. Bottom trays each support 1122 pounds.



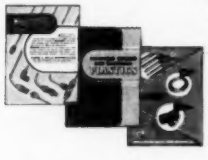
Verascope Stereo Viewer Molded for Busch Camera Corp., Chicago



Skillful Molding views a true-to-life picture!

Look at this viewer and you will see much more than a skillfully molded housing for a superb stereo optics system. You will see another reason why we are especially well equipped to mold your camera and photographic products—or any thermoplastic products for that matter. We can tell you a long story of product molding and engineering accomplishments. There's plenty of variety in this story for we have molded low cost mass production items, as well as outstanding sellers in the luxury price class.

Thus we know how to strike the proper balance of quality and economy that results in a top grade job within your production budget. We'd like to show you how we can do the best custom molding job for you. Let us know today where and when we can tell you our story.



Write on your letterhead for the new Injection Molded and Extruded Plastics Catalog. Or, for detailed information about [redacted] piping, tubing and fittings, write for circulars containing data and illustrations.*

**Trademark Registered*

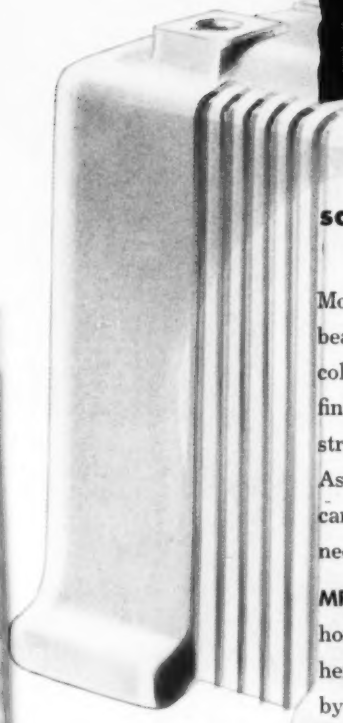
ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Fibestos, Lucite, Nylon, Plexiglas, Polystyrene, Styron, Loalin, Vinylite, Geon, Flexene, Polyethylene, Cerex, Forticel, [redacted]*, Saran, and other Thermoplastic Materials.

2930 NORTH ASHLAND AVENUE • CHICAGO 13, ILLINOIS

Large Plastic Housings

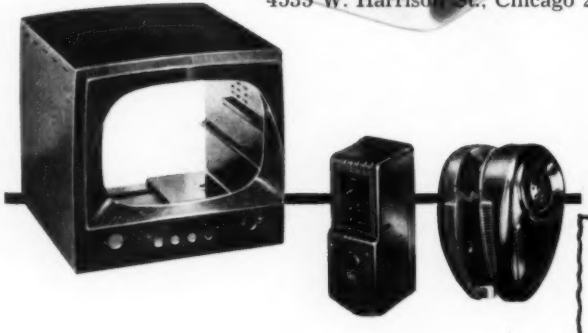
CUSTOM MOLDED BY MPc



save metal...save labor...add new beauty

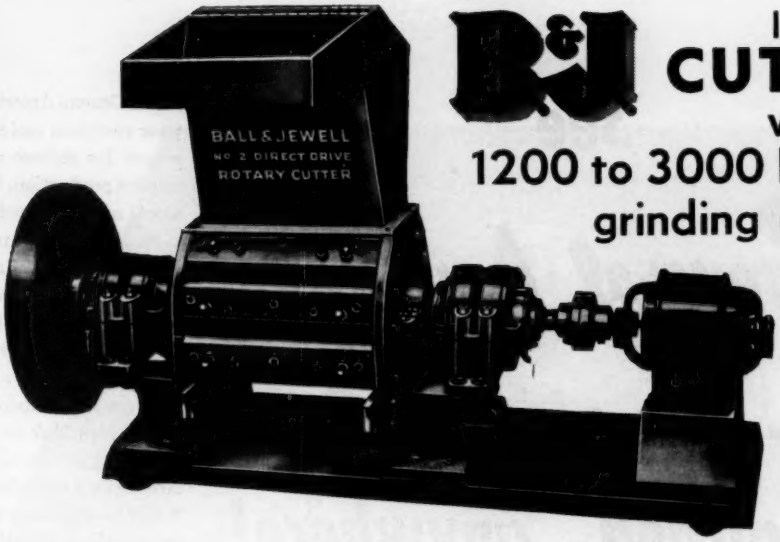
Molded plastic housings represent a happy union of beauty and utility. Their mold-perfect finish is sleek, colorful, pleasant to the touch...requires no costly finishing. At the same time, they provide a rugged structural framework for the interior mechanism. Assembly holes, studs and rails, shelves and partitions can be integrally molded. No costly fabrication is needed. Assembly is fast, accurate and easy.

MPc has pioneered in the development of cabinets and housings of far greater weight and size than anything heretofore available. Investigate plastics, custom-molded by **MPc,** to expedite your production program. Write to MOLDED PRODUCTS CORPORATION, 4535 W. Harrison St., Chicago 24, Illinois.



PLASTICS DIVISION
MOLDED MPc PRODUCTS
CORPORATION
...Pace-Makers in Plastics Molding

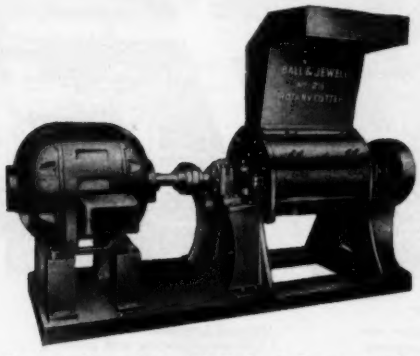
FREE "Data Book of **MPc** Facilities," an engineering-eye view of **MPc** press capacities and other production facilities... together with a survey of **MPc** special skills available for your use. *Write for your copy.*



B&J large CUTTERS with 1200 to 3000 lbs. per hr. grinding capacity!

▲ **Ideal for grinding** milled vinyl and all type of plastic scrap, the No. 2 B & J will cut practically any size or weight piece that can be fed into hopper . . . at up to 2,000 lbs. per hr. 8″ x 28″ throat opening.

Here's a low cost unit considering its high production capacity—up to 1,500 lbs. per hour. No. 1½ installation is shown arranged for direct drive. ▶



◀ **At up to 3,000 lbs.** per hr., this No. 2½ machine is suitable for all types of scrap, has 36″ x 12″ throat. This allows for feeding of extra large lumps without prior breakdown.

Contact Your Nearest B & J Representative

SAN FRANCISCO, CALIFORNIA: B-H-S Machinery Sales Company; LOS ANGELES, CALIFORNIA: Machinery Sales Corporation; PITTSBURGH, PENNSYLVANIA: Stanley Berg & Company; OMAHA, NEBRASKA: Fuchs Machinery & Supply Co.; CINCINNATI, OHIO: Index Machinery Corporation SPOKANE, WASHINGTON: W. R. Matthews Machinery & Tool Supply Company; CHICAGO, ILLINOIS: Neff Kohlbusch & Bissell; MILWAUKEE, WISCONSIN: Neff Kohlbusch & Bissell; MINNEAPOLIS, MINNESOTA: Charles W. Stone Company; LEOMINSTER, MASSACHUSETTS: Standard Tool Company; DETROIT, MICHIGAN: Thoreson-McCosh, Inc.; CANADA—TORONTO & MONTREAL: Williams & Wilson Ltd., FOREIGN DISTRIBUTORS: Omni Products Corp., New York 16.

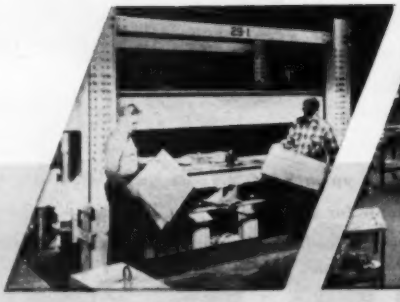
BALL & JEWELL

26-28 Franklin Street, Brooklyn 22, N.Y.

See General American for plastics facilities unmatched...anywhere!

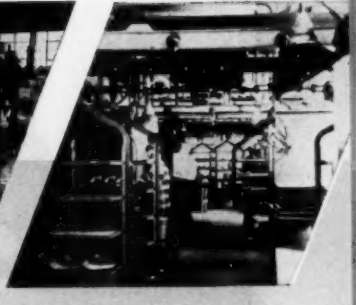
Make General American your complete molding source for *defense* and *civilian* production. Use most modern production-line equipment available . . . *facilities unmatched* anywhere in scope and versatility. Take advantage of skilled personnel . . . engineers, die-makers, set-up men. Ask to see samples of General American's experience with hundreds of different plastics applications . . . which have speeded production and bettered products in many industries. Write us about *your* problem . . . we'd like to help you.

PLASTICS DIVISION GENERAL AMERICAN TRADE MARK



LOW PRESSURE MOLDING
48" x 144" low pressure molding of reinforced plastics . . . supplemented by smaller presses.

TOOL AND DIE SHOP
General American maintains one of the most extensively equipped and modern shops in the country. Completely mechanized.



IN ADDITION . . .
General American offers high speed Logoquant-treating and painting . . . plus a complete assembly and packing service.

MORE MEN AND MACHINES TO PRODUCE YOUR PRODUCTS BETTER

PLASTICS DIVISION • GENERAL AMERICAN TRANSPORTATION CORPORATION

HIGH-SPEED INJECTION MOLDING

Injection equipment at General American includes largest machines ever built.

An overhead crane supplies material. Continuous conveyors carry away finished products.

1—2 oz. machine
3—8-oz. machines
2—16 oz. machines
10—22 oz. machines
4—32 oz. machines
(either Acetate or Polystyrene)
4—48 oz. machines
(either Acetate or Polystyrene)
5—48 oz. for Polystyrene
or 60 oz. for Acetate
2—85 oz. machines
(either Acetate or Polystyrene)
1—300 oz. machine
(either Acetate or Polystyrene)

MULTI-CAVITY COMPRESSION MOLDING
up to 71" x 74" platen areas

General American compression presses have turned out some of the largest plastics pieces ever produced.

3—2000 ton presses
1—1400 ton press
1—1200 ton press
2—1000 ton presses
4— 500 ton presses
10— 350 ton presses
6—100 ton presses

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 S. La Salle Street • Chicago 90, Illinois • New York 17, 10 E. 49th Street • Detroit 2, 2842 W. Grand Blvd.

PLASTICS SCRAP

bought sold reworked

We offer
the World's finest facilities for:
RECLAIMING • REPROCESSING
RECOMPOUNDING • RECOLORING

We reprocess *Your* Plastics Scrap, By-Products, Surplus for *Your* own Re-Use.
We have complete laboratory facilities for Testing, Analyzing, and Pilot Running of Customer's Materials.

GRANULATING • PELLETIZING
CHEMICAL FLOTATION • WASHING • CLEANING • DRYING
SEPARATION OF CONTAMINATED MATERIALS
REMOVAL OF FOREIGN MATTER
COMPOUNDING • MIXING • COLORING • EXTRUSION

UNLIMITED KILN DRYING FACILITIES

OUR SERVICE

As the world's leading Plastics Scrap Reclaimers we offer the almost unlimited facilities of our vast plant to industry in these days of shortages in all basic raw-materials.

We have available over 150,000 sq. ft. of floor space devoted exclusively to the processing of plastics — virgin and scrap — resinous materials or by-products.

We specialize in the reduction to small particles — to your most exacting specifications — of all lumps, blocks, mill ends, bleeder waste — regardless of size and whether rigid or soft.

We also custom-compound *all* thermoplastics to your specifications.

A. BAMBERGER

CORPORATION
PLASTICS MATERIALS
703 Bedford Avenue, Brooklyn 6, N. Y.
Phone: MAin 5-7150
CABLE: CHEMPROD BROOKLYN

AMPACET CELLULOSE ACETATE

Available in crystal-clear, transparent and all colors—transparent, translucent and opaque. For injection molding and extrusion.

AMPACET ETHYL CELLULOSE

Unsurpassed for impact strength and durability, AMPACET EC has been accepted by the Armed Services for a multitude of uses. Whenever your product calls for the superior qualities of Ethyl Cellulose molding compound make it a point to consult us.

AMPACET POLYSTYRENE

SPECIAL COLORS — SPECIAL EFFECTS

PHOSPHORESCENTS *for products that must glow in the dark, but retain their rich, colorful beauty in daylight.*

MOTHER OF PEARL, *the ideal plastic material for decorative articles — toilet wares and cosmetic containers, toys and nursery items, jewelry boxes, bathroom fixtures, clock and instrument housings.*

METALLICS AND TINSELS. *Unusual effects of sparkling brilliance.*

We custom color to your specifications—colors are matched accurately and kept constant time after time.

AMPACET VINYL COMPOUNDS

For injection and extrusion, formulated to meet your specific requirements.

As manufacturers of prime thermoplastic molding compounds we are geared to fulfill the most rigid specifications. Also, our large plant facilities enable us to cooperate efficiently with customers' special requirements for storage and drop shipping.

AMERICAN MOLDING POWDER and CHEMICAL CORP.
AN AFFILIATE OF A BAMBERGER CORPORATION

703 BEDFORD AVENUE, BROOKLYN 6, N. Y.
Phone: MAin 5-7450 • Cable: CHEMPROD BROOKLYN

NEW BRIGHTNESS in every room through TITANOX PIGMENTED PLASTICS

Useful plastic products in glistening whites and gay tints sparkle throughout today's modern home. Bathrooms are being glamorized through such plastic products as shower curtains, soap dishes, towel racks, brush handles, drinking cups, wall tile, seats. And TITANOX titanium dioxide pigments go a long way in helping make these attractive plastics possible.

TITANOX pigments are compatible with all types of plastics and because of their inertness will not alter the physical characteristics of your products. Their fine and uniform particle size affords easy mixing and compounding for consistent results.

The rutile types of titanium dioxide pigments are universally acceptable to most types of plastics—TITANOX-RA for outstanding whiteness in stocks of low loadings, TITANOX-RCHT for heavily loaded stocks and tints. However, when exceptional whiteness is imperative, TITANOX-A, the anatase titanium dioxide, is often preferred.

Our Technical Service Department is always available for assistance in the pigmentation of your natural or synthetic polymers. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments, Ltd., Montreal 2; Toronto 1.

9071

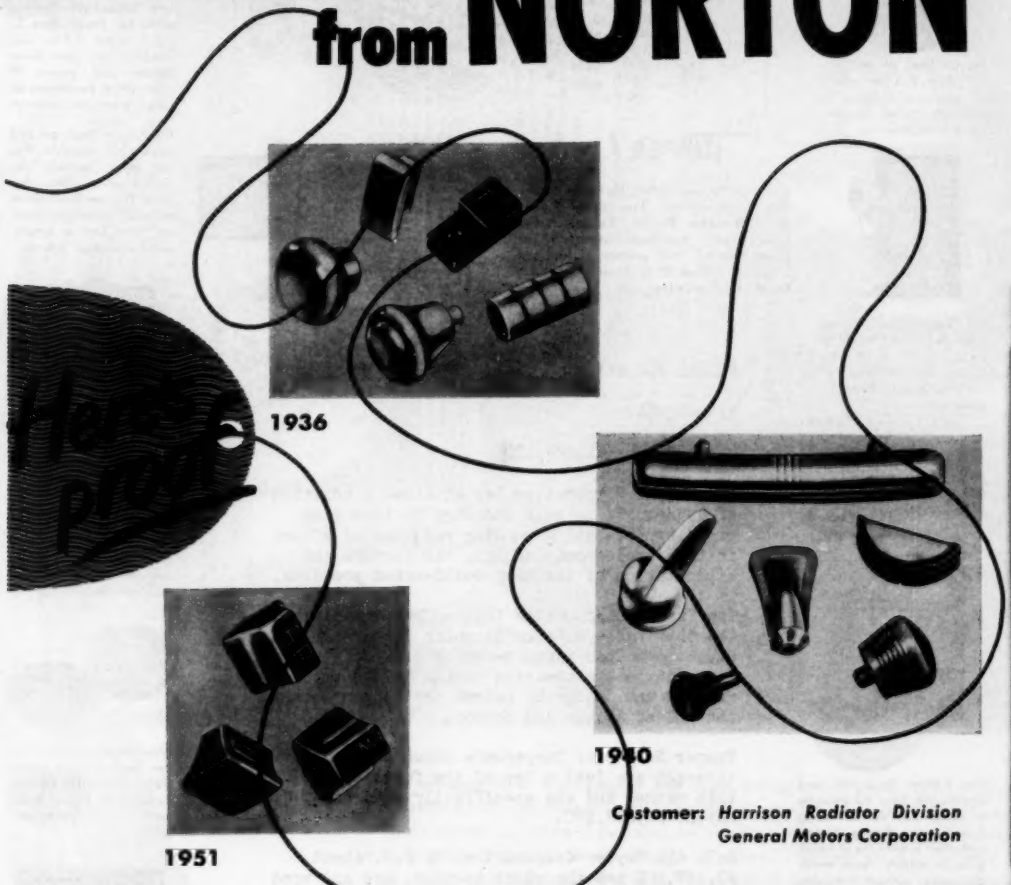
TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

CUSTOMERS RE-ORDER with confidence from NORTON



Customer: *Harrison Radiator Division General Motors Corporation*

In the course of a year the heaters, defrosters and thermostatic controls made by the Harrison Radiator Division of General Motors require knobs and handles running into the hundreds of thousands. These moldings must be perfect in every detail—in keeping with the traditionally fine reputation of all General Motors products.

Economical, precision production of very large quantities of small moldings like these is a task for which Norton's facilities are particularly well suited. So it's not a wonder that General Motors has made Norton the mainstay for their supply.

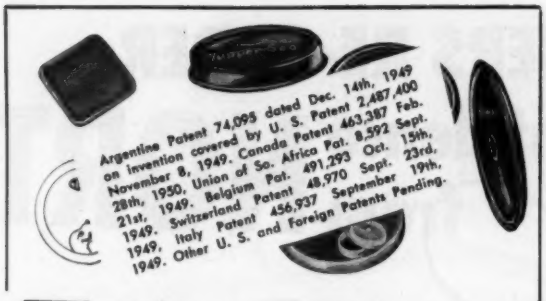
As have other Norton customers, they have learned the value of the skilled engineering assistance, sensible pricing, flawless molding, dependable and cooperative service which they invariably receive.

You will find it worth your while to ask Norton's opinion on any project involving the use of plastics. For a free survey of your next molding assignment by an engineer from our nearest sales office, write today. Norton Laboratories, Inc., Lockport, New York. Sales offices: *New York — 175 Fifth Avenue; Chicago — 5221 Kimbark Avenue.*

NORTON *Laboratories, Inc.*

COMPRESSION AND INJECTION MOLDING

Tupper Seal, air and liquid tight flexible covers fit, and are included in the sets of all Tupperware Canisters.



Argentine Patent 74,095 dated Dec. 14th, 1949 on invention covered by U. S. Patent 2,487,400 November 8, 1949. Canada Patent 463,387 Feb. 28th, 1950. Union of So. Africa Pat. 8,592 Sept. 21st, 1949. Belgium Pat. 491,293 Oct. 15th, 1949. Switzerland Patent 48,970 Sept. 23rd, 1949. Italy Patent 456,937 September 19th, 1949. Other U. S. and Foreign Patents Pending.

There's a Tupper Seal, air and liquid-tight flexible cover for Tupperware 2, 5, 8 and 12½ oz. Tumblers too, and these Tupper Seal, covers fit many other containers of metal, glass and crockery.

TUPPER! Seals

air and liquid-tight, flexible covers for Tupperware Tumblers, Canisters, Wonder Bowls, Cereal Bowls and many another container of glass, metal and pottery, the contents of which it is desired to keep fresh and wholesome.

TUPPER!

The Tupper Seal, air and liquid-tight flexible Pour All cover for Tupperware Bread Server which serves as a bread tray also is designed to give similar results as Tupper Seal, air and liquid-tight Flexible covers. Keeps contents fresh as no other such container.

The Tupperware 50 oz. Canister is "standard equipped" with the Tupper Seal, air and liquid-tight flexible Pour All cover.

The Tupper Seal, air and liquid-tight flexible Pour All cover is used on every Tupperware 20 oz. Canister.

The cover of the Tupperware Bread Server which serves as a bread tray also is designed to give similar results as Tupper Seal, air and liquid-tight Flexible covers. Keeps contents fresh as no other such container.

FORMAL NOTICE! 9th November, 1949

EXCLUSIVE!

U. S. Patent #2,487,400

The Tupper Corporation has attained a position of leadership in this industry by incurring great expense and expending painstaking effort in the development, design, manufacture and exploitation of its many world-known products.

The Tupper Corporation further has anticipated the inevitable attacks to which leadership is subject and has taken measures provided by law to preserve the creative rights to its products, methods and design by patent protection both in the United States and abroad.

Tupper Seals for Tupperware shown in this advertisement are just a few of the forms covered in this manner and are specifically covered by U.S. Patent #2,487,400.

Only the Tupper Corporation, by U.S.Patent #2,487,400 has the right to make, use and vend container closures in connection with any and all types of containers throughout the United States and its territories as covered by the claims of the Patent.

Tupper Corporation will protect, according to law, the exclusive rights above granted

TUPPER CORPORATION

The Tupper Seal, air and liquid-tight, Pour All cover as a cover for 46 oz. cans; Tupperware Sauce Dishes and other containers of metal, glass or pottery. Foods easily dispensed without removing entire cover.

When equipped with Tupper Seal, air and liquid-tight, flexible covers, Tupperware Cereal Bowls serve many another purpose.

The Tupperware Wonder Bowls are usually fitted with Tupper Seal, air and liquid-tight covers.

The Tupper Seal, air and liquid-tight flexible cover made for Tupperware 8 oz. Tumblers also fits and is sold with all Tupperware Funnels as a base when funnels are used as storage containers.

TUPPER CORPORATION

Manufacturers of — CONSUMER, INDUSTRIAL, PACKAGING AND SCIENTIFIC PRODUCTS

FACTORIES: Farnumsville, Mass., and Cuero, Texas New York Show Rooms 225 Fifth Ave.

ADDRESS ALL COMMUNICATIONS TO: Department B

COPYRIGHT TUPPER CORPORATION 1950

Colorful Living Begins on a Calender

An exciting new era of color has been brought to America; and modern plastics have contributed greatly to its advance. Gossamer-light but sturdy table covers and shower curtains, lovely floral drapes, gleaming dinnerware, upholstery coverings in the clear, rich tones of woven fabrics—science and skills have been developed to produce them all in plastics. No other medium offers the designer such range and richness of color, combined with other properties required for fabrication in industry.

For over 60 years Adamson United has had an important part in perfecting modern equipment and methods for the satisfactory and economical production of calendered materials.

If your plans call for new installations either of single units or of complete electronically controlled trains with all accessories, consult us. Our development, designing and manufacturing facilities are at your service.

SINCE 1892

. . . leaders in the Development, Design and Manufacture of Basic Machinery and Processes for Rubber and Plastics

Adamson United Company

730 Carroll Street

Akron, Ohio

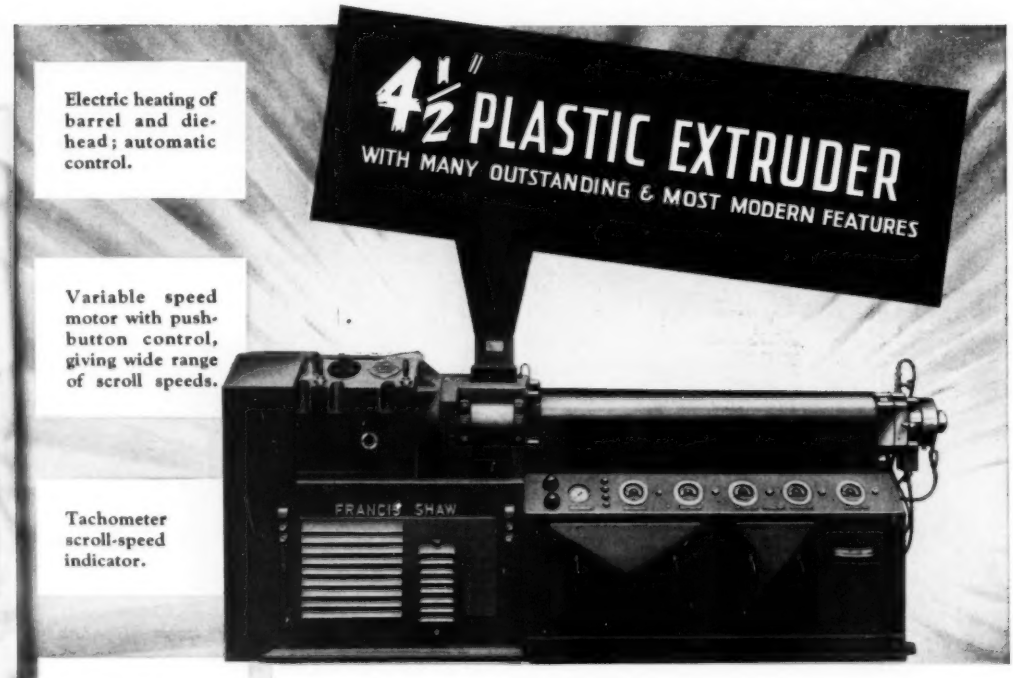
Sales Offices In Principal Cities

Subsidiary of United Engineering and Foundry Company

***Plants at:* Pittsburgh • Vandergrift • New Castle • Youngstown • Canton**

A new SHAW arrival

THE LATEST ADDITION TO OUR FAMILY



Electric heating of barrel and die-head; automatic control.

Variable speed motor with push-button control, giving wide range of scroll speeds.

Tachometer scroll-speed indicator.

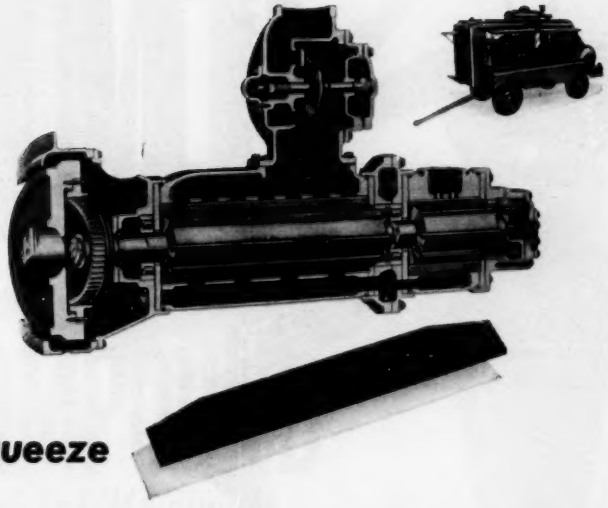
Water-cooled feed hopper and scroll.

Supplied with or without roller feed.

BRITISH MADE

Every practical user will like the features of the latest range of SHAW Extruders for plastic materials such as polyvinylchloride, acetate, polystyrene etc. The careful choice of materials from which they are made means long life and dependable working without shut-down.

FRANCIS SHAW & COMPANY LIMITED
MANCHESTER 11 · ENGLAND



How to put on the squeeze

In the illustration above you see vanes used in the new Ingersoll-Rand Gyro-Flow portable air compressors. These vanes do an unusual job. They are made from an unusual material—Synthane laminated plastic.

The vanes are inserted in slots in a rotor which is mounted off-center in a cylinder. As the rotor spins, centrifugal action forces the Synthane vanes against the inside of the cylinder to form chambers between the vanes. Because of the eccentric mounting, these chambers constantly change in dimension. As they enlarge, air is drawn through intake ports in the cylinder walls. As they contract, the air is forced under pressure through discharge ports.

The result is a steady flow of compressed air without pulsation or vibration. Because of the complete simplicity of the machine, the compressor is lighter, more efficient, more economical to operate than conventional compressors.

It is apparent that the vanes are important components. They must be strong, light in weight, unaffected by the oils used to lubricate and form an air-tight seal between the vanes and the cylinder walls. They must be hard and dense to stand up under continuous operation yet not so hard as to score the walls of the cylinder.

Synthane has all of these properties and many more. In fact, it has so many useful mechanical, electrical and chemical characteristics that it cannot be adequately described in less than a complete catalog. If you have need for such material, a catalog containing a complete description of Synthane may be obtained by writing Synthane Corporation, 8 River Road, Oaks, Pennsylvania.

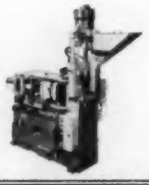
PLASTICS WHERE PLASTICS BELONG

SYNTHANE

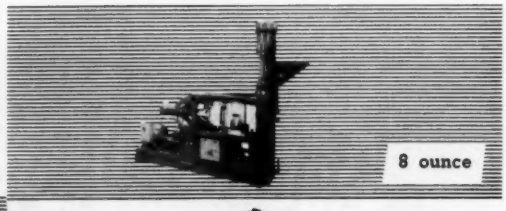
Manufacturers of laminated plastics

LESTER

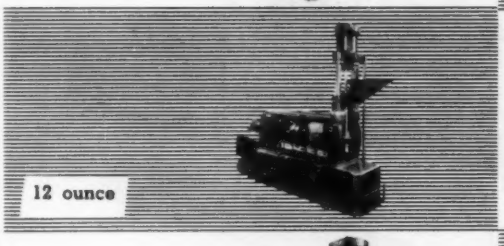
the preference of leading molders



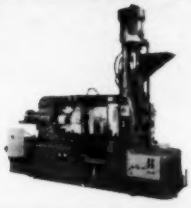
4 ounce



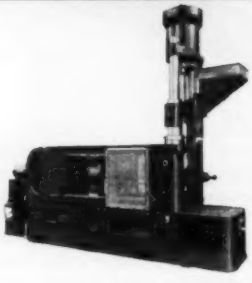
8 ounce



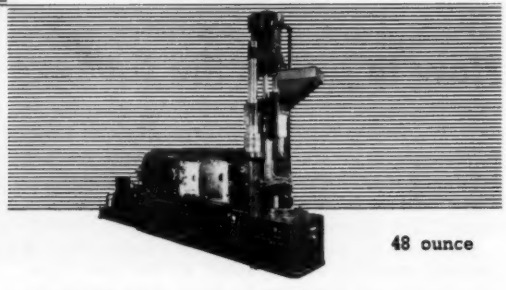
12 ounce



20 ounce



32 ounce



48 ounce

Only Lester Injection Molding Machines, ranging from 4 to 48 ounces, gives you these important features: "TORRID-ZONE" INTERNAL HEAT FOR GREATER PLASTICIZING; ONE-PIECE CAST STEEL FRAME FINISHED WITH DIE-MAKER'S PRECISION; SINGLE POINT DIE HEIGHT ADJUSTMENT; THE VERTICAL INJECTION SYSTEM.

A specially prepared file folder with complete specifications of the machine of your choice is available on request—or check with the representative in your area listed below.

LESTER INJECTION MOLDING MACHINES

distributed by LESTER-PHOENIX, INC., 2621 CHURCH AVENUE • CLEVELAND 13, OHIO

REPRESENTATIVES

New York . . . . . Steven F. Krould
Detroit . . . . . Thoreson-McCosh
Chicago . . . . . J. J. Schmidt
Cleveland . . . . . Don Williams
Cincinnati . . . Index Machinery Corp.
Los Angeles . . Seaboard Machinery Co.
San Francisco . . . . . J. Fraser Rae
St. Louis, Milwaukee . . . A. B. Geers
New England . . . Kavanagh Sales, Inc.

FOREIGN

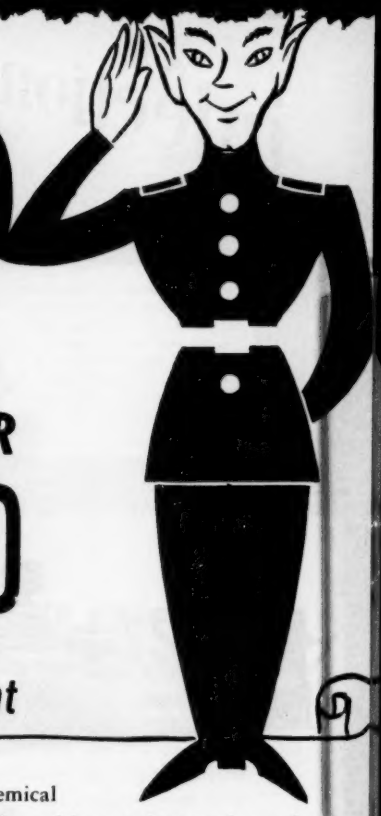
Toronto, Canada . Modern Tool Works, Ltd.
London, England . . Dowding & Doll, Ltd.
Calcutta, India . . Francis Klein & Co., Ltd.
Sydney, Australia . . Scott & Holladay, Ltd.
Japan, New York . . W. M. Howitt, Inc.

MOLDERS!!

'TEN-SHUN!!

Announcing.... DRYPLY

PRE-IMP



GLASS FIBER reinforced POLYESTER

MOLDING COMPOUND

For Compression and Transfer Molding
Usable on present Standard Equipment

NEW! BETTER! Combines the exceptional chemical resistance of polyester resin with the high impact, physical strength, and heat resistance that only glass fibers can impart.

MADE of glass fibers uniformly pre-impregnated with polyester resin and cut to size ready for use in standard compression and transfer molding techniques.

WRITE, WIRE OR PHONE FOR DETAILS NOW!

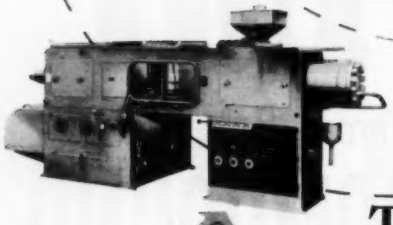
Flexfirm PRODUCTS

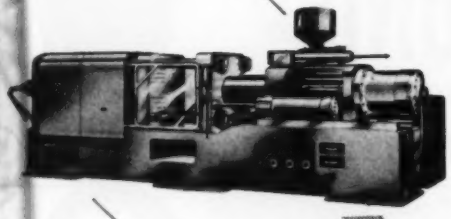
PRE-IMP DIVISION

2300 No. Chico Ave. • El Monte, Calif. • CUmberland 3-1

focus on injection moulding machines

PECO PROJECTILE PRODUCTS





THE attention of Plastics manufacturers may profitably be centred on PECO Injection Moulding Machines, for they are designed to give high productivity through maximum efficiency.

They are built in 2oz., 4oz., 6oz., 8oz., and 16oz. capacities. They represent the most up-to-date development of this type of plant.

Full particulars will be sent on request.

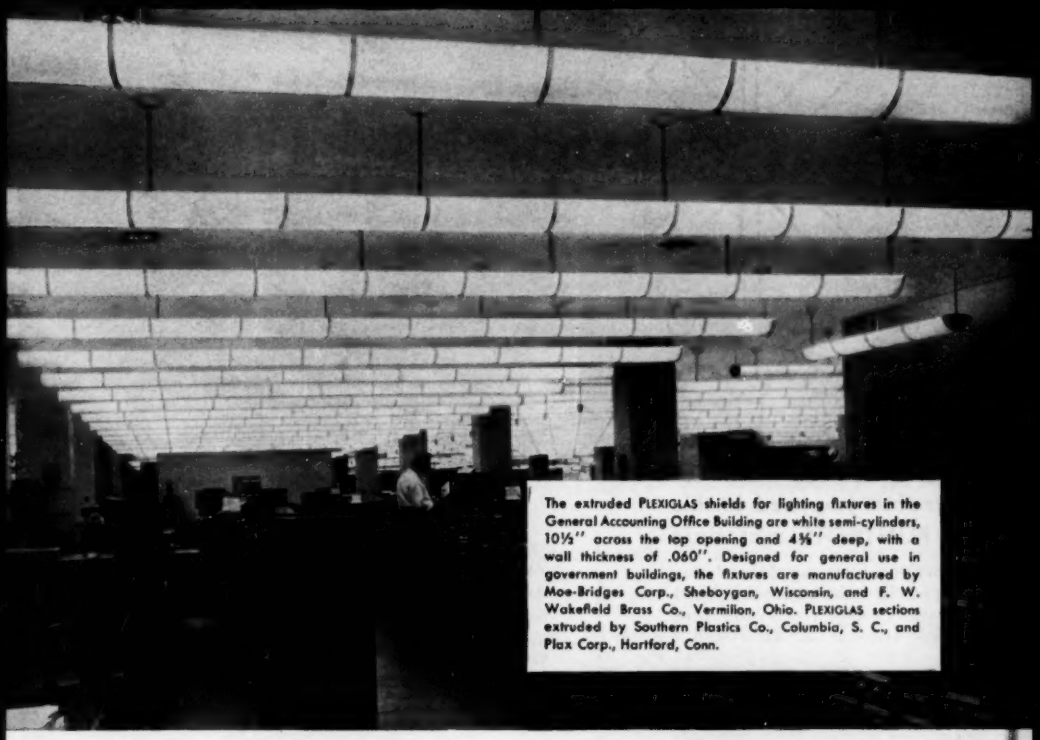
MOULDS

PECO MOULDS. Expert designers and mould makers are employed and moulds can be supplied to samples submitted, including die-sinking models if desired. An important side of the Company's work is the hobbing of cavities for moulds and medallions—the plant includes a 3,000-ton Hobbing plant. Master Hobs to customers' samples made as required.

THE PROJECTILE & ENGINEERING COMPANY LTD.

ACRE STREET, BATTERSEA, LONDON, S.W.8, ENGLAND

Telephone: Macaulay 1212 Telegrams: "Profectus, Claproad, London". Cables: "Profectus, London".



The extruded PLEXIGLAS shields for lighting fixtures in the General Accounting Office Building are white semi-cylinders, 10½" across the top opening and 4⅝" deep, with a wall thickness of .060". Designed for general use in government buildings, the fixtures are manufactured by Moe-Bridges Corp., Sheboygan, Wisconsin, and F. W. Wakefield Brass Co., Vermilion, Ohio. PLEXIGLAS sections extruded by Southern Plastics Co., Columbia, S. C., and Plax Corp., Hartford, Conn.

25 Miles of EXTRUDED PLEXIGLAS

At the new General Accounting Office Building in Washington, twenty-five miles of PLEXIGLAS acrylic plastic shields are used to reflect and transmit light from nearly thirty-three thousand fluorescent fixtures. Extrusion-grade PLEXIGLAS made possible the most economical production of shields that would meet the rigid requirements of the application—dimensional stability, resistance to discoloration and breakage, and control of the transmittance-reflectance ratio.

For *your* large volume applications requiring extruded parts, consider PLEXIGLAS. Extrusion-grade PLEXIGLAS molding powders are being used for a wide variety of shapes—curved panels, tubes, rods, and flat and corrugated sheets. Such sections have the familiar PLEXIGLAS properties of light weight, durability, dimensional and color stability, and resistance to age and weather.

For information on clear and colored PLEXIGLAS powders for injection and extrusion molding, write for our technical bulletins. We'll be glad to send you full details.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

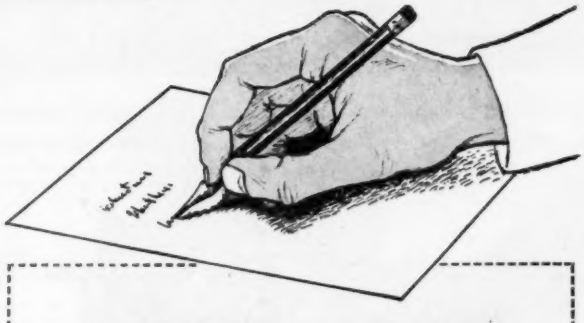
WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

PLEXIGLAS is a *trade-mark, Reg. U. S. Pat. Off. and in principal foreign countries.*

Canadian Distributor: *Crystal Glass & Plastics, Ltd., 130 Queen's Quay at Jarvis Street, Toronto, Ontario, Canada.*

STOP... LOOK...and LIST 'EM!



...There may be several types of products that you need in this list of FLINTKOTE materials

Surely, there's at least *one* place in your plant or processes where materials listed on this page can serve you . . . and serve you *better.*

Maybe it's an improved kind of saturant you need. A new adhesive. Or a sizing . . . a protective coating . . . a mastic flooring emulsion . . . or products for waterproofing or dampproofing. The FLINTKOTE Line includes them all . . . and *more.* They're all *quality* products . . . all FLINTKOTE-made.

Maybe you're looking for a *brand new* product. One that improves your plant protection or your manufacturing processes. A *tailor-made* one—that no one else has been able to give you. Our research staff will be glad to help you develop it.

You can get a finished product . . . or one to use as a component in your own formulations.

We manufacture in volume . . . with plants from coast to coast.

So read the list at the right—make *your own* list—and send it to us for complete information, specifications and prices. No obligation, of course—and you'll be mighty glad to have FLINTKOTE as another reliable source of supply.

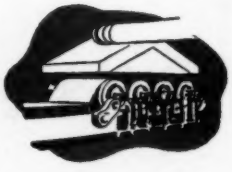
THE FLINTKOTE COMPANY
Industrial Products Division
30 Rockefeller Plaza, New York 20, N. Y.

Atlanta • Boston • Chicago Heights • Detroit
Los Angeles • New Orleans • Washington
The Flintkote Co. of Canada, Ltd., 30th St., Long Branch, Toronto, Canada

ADHESIVES

- Asphalt Emulsions—cold applied
- Asphalt and Rubber Compounds
- Solvent Rubber Cements
- Synthetic Rubber and Resin Compounds
- Rubber and Resin Water Dispersions
- Asphalt Tile Cements

SATURANTS and SIZINGS



- Asphalt Products for Waterproofing paper, cloth, building materials
- Rubber Compounds for Carpet Backing and impregnating
- Binders for various compositions
- Tire Cord Dipping Solutions

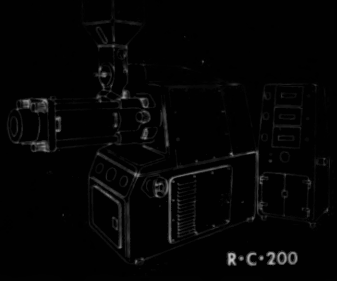
COATINGS

- Products for Waterproofing and Dampproofing
- Protection for Thermal Insulation
- Corrosion-Resistant Protection
- Sound-Deadening—Spray-on Anti-Slip Floor Coating
- Joint and Crack Sealers—hot and cold applied
- Asphalt Base Aluminum Paint

FLINTKOTE
Products for Industry

R·C·65

R·C·100



R·C·200

These machines manufactured under L.M.P. Patents

Now Turn to F·J·Stokes Advertisement Page 43

R. H. Windsor, Ltd.

have much pleasure in announcing the appointment of

F. J. STOKES MACHINE COMPANY

as Exclusive United States Agent

For MULTI-SCREW EXTRUDERS

R·C·65 R·C·100 R·C·200

As agents, Stokes will sell, install and service these world-famous machines for extruding, compounding, coloring and re-claiming scrap. A full stock of parts will be maintained, and special dies and cross-heads for multi-color and multi-material extrusions will be designed and manufactured to specification.

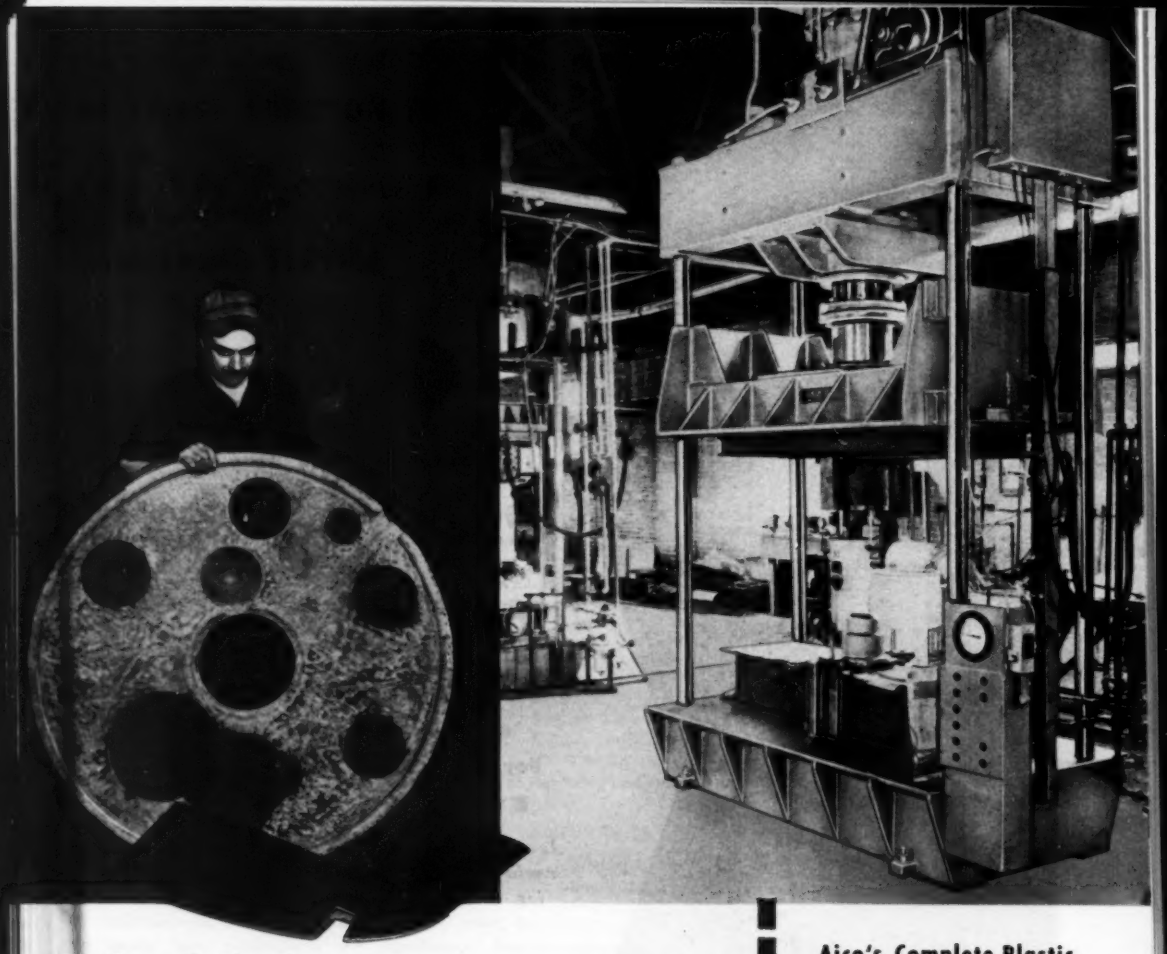
All United States Inquiries to

F. J. STOKES MACHINE COMPANY

5934 TABOR ROAD, PHILADELPHIA 20, PA.

All Other Inquires to R. H. WINDSOR LTD.
16, Finsbury Square, London E.C.2, England

SERVING THE WORLD'S PLASTIC INDUSTRY
Windsor
TRADE MARK



Reinforced Plastics . . . MANY COMBINATIONS OFFER A WIDE RANGE OF SPECIAL PHYSICAL PROPERTIES

In the molding of reinforced plastics; resins, reinforcements and catalysts are mixed in many different combinations to obtain a wide latitude of physical properties.

Compared on a strength to weight basis, reinforced plastics are superior to steel. Because of this exceptional strength, reinforced plastics are being widely used for aircraft parts, radomes, motor housings, structural members, etc. Low mold costs and relatively short tooling time make it practical to produce short runs as well as production quantities.

Consider reinforced plastics to relieve your material shortage . . . or provide better physical properties to improve your product. An Aico engineer will be glad to discuss your needs. Drop us a line today.

AMERICAN INSULATOR CORPORATION
NEW FREEDOM, PENNSYLVANIA

Aico's Complete Plastic Molding Service Includes:

ENGINEERING COUNSEL on proper molding methods and materials.

MOLD BUILDING to avoid division of responsibility.

INJECTION MOLDING for high rate of production . . . low unit cost.

COMPRESSION MOLDING of large parts with heavy cross sections.

COLD MOLDING of electrical parts requiring high heat resistance.

REINFORCED PLASTICS . . . a relatively new development in low pressure molding of reinforced resins . . . especially suitable for large moldings requiring special physical properties.

Aico plastics

A SPECIAL SERVICE TO MODERN PLASTICS READERS, REPORTING AND INTERPRETING THE LATEST NEWS AND DEVELOPMENTS FROM WASHINGTON AND ELSEWHERE AS THEY AFFECT THE PLASTICS INDUSTRY AND THE MOBILIZATION PROGRAM

Modern Plastics BULLETIN

October 19, 1951

Slow-Down or Build-Up?

The situation in plastics materials supply as we go to press is probably the most peculiar that ever existed in the history of the industry. The Government and raw material producers are making hurried efforts to increase the capacity of the industry as rapidly as possible, yet soft markets exist in practically every branch. Even military DO orders for October decreased for such scarce materials as polyethylene, nylon, and Teflon although the reason is supposed to be that metals were not available to use with them. Ethyl cellulose, which a short time ago was going about 40% to military uses, was down to less than 15% and civilian demand had also dropped to such an extent that plans to put the material on allocation in November have been at least temporarily abandoned.

Phenolics are in such a good state of supply that a strike which stopped production by one of the largest producers for several weeks brought scarcely any complaints of shortages. Polystyrene and vinyl chloride are plentiful—the expected upsurge in September was small, although October orders are reportedly on the rise.

Cellulose ester molding material seems in good supply despite the heavy curtailment of production by a leading producer. Yet the Federal Reserve Board production index for all industry stood at 220 in September—only 3 points under the postwar peak and a rise of 7 points from July's low.

Cutbacks Due to Lack of Metal

It is not too difficult to understand the drop in civilian demand for plastics. Cutbacks due to metal shortages in hard goods such as automobiles, refrigerators, television sets, washers, vacuum cleaners, etc., have cut production of these big volume plastics users. A shortage of metal for wire has affected vinyl. Plastics producers anticipated that these cutbacks would affect plastics raw material demand as far back as last April or May. In addition, inventories of finished goods all over the country are at a record high and the consumer is marking time before going on another buying spree.

In Washington there is a strange feeling in the atmosphere which might be described as akin to that eerie moment just before a cyclone when everyone is thinking: "Will it strike us or pass us by?"

But despite this feeling of uncertainty, practically all government officials with whom we have talked believe that the expansion program must go on as planned. We can't afford to take chances. We must build an economy that can produce enough for both bullets and butter over a long period of years. They believe that government spending in such huge volume will eventually take up the current slack and that wages paid out for government contracts will put the population in a mood and position to buy up everything now in inventory or likely to be produced.

Expansion Program Moves Slowly

There are several reasons for this belief. First, industry in general is nowhere near tooled up yet to take care of the orders to come for planes, tanks, guns, missiles, etc. Secretary Lovett's idea, as was Marshall's, is to build a production plant that can take care of any emergency before starting actual production. The military are still extremely cautious about freezing models and starting production. The whole military program has been slow in gaining momentum. Director Wilson now says that peak production will be "in" 1953 instead of "by" 1953 which he used to say. Immediate procurement has been slowed up because 1952 budgets are not ready and officials are feeling around before spending their money. At the end of the 1951 fiscal year in May and June they were spending furiously to use up that fiscal year's budget allowance. One official said: "If we have an armistice it will take the Army 10 years to make up their mind as to what they want—it only takes 5 years at present."

Nevertheless, over 3 billion dollars a month is now being spent for the various defense projects and it will be 4 billion by the end of the first quarter of 1952.

Transition Period Always Rough

During this transition from civilian to military buying, the plastics industry may have tough going. Vet-

erans in the industry point to the past as an example of what may happen in the future. In 1941 the industry was operating at an historic high volume; after Pearl Harbor there was very little business. It was late in 1942 before the military orders started rolling in. And no one can tell now just where the big volume of plastics is going for defense business. A plastics expert in Detroit recently visited the Tank Arsenal there and says there are almost no plastics in a tank. But airplanes, missiles, and electronic equipment are loaded with plastics. Now is the time for the plastics industry to get out and start looking for sub-contracts in a more energetic manner than heretofore.

The Squeak for Chemicals

The chemical industry has at long last come to the conclusion that the American public and other branches of industry should be informed on the essentiality of chemical products, should be told that steel, aluminum, paper, plastics, and many other industries must have chemicals to produce their products. The textile industry makes a great to-do about its synthetic fibers, but the chemical industry produces them; the lumber industry gives us plywood, but chemicals provide the adhesive; agriculture provides more food per acre, but chemical fertilizers help make it possible . . . the examples could go on and on and on.

What brings this situation to a head is the chemical industry's inability to get enough steel for its expansion program. Many persons think the reason is at least partially because the squeaking wheel gets the grease. The chemical industry, with a long tradition of dignity, secrecy, and inter-industry competition, has failed to squeak loud enough. It has finally dawned on the industry that it pays to speak up. Benzol is an example. Wide publicity of the need for benzol, begun in 1947, has made the country conscious of the essentiality of that chemical. Without such knowledge it is doubtful that the plans to make us self-sufficient would be so far along as they now are. But there are scores of other chemicals which will soon be sorely needed to the extent that they could hold up other industries if not available. The success of the benzol awakening encourages the industry to think that other programs may be sold to the country in the same way. Far-sighted chemical executives are now at work on such a program. A new facilities branch of the Chemicals Div. of N.P.A. is at work on the problem. Many of the chemicals involved form the very heart of the plastics industry.

Who Will Get Steel?

The chemical industry made 750 applications for controlled metals (steel, copper, aluminum) for the last quarter of 1951. Recommended for fulfillment were 172, but only 82 got their metal. Still in abeyance are 90. The industry got less than 40% of the steel it asked for and the feeling is that its program has been severely delayed with the result that other critical industrial expansion programs will be held up because there won't be enough chemicals to serve them. The first quarter of 1952 will be somewhat better for steel acquisition, but only the most critical chemicals will benefit. Those of interest to plastics are naphthalene, phthalic anhydride, and polyethylene. Those in need which, in the first quarter, will get little or no steel (outside of those plants which are already well along) are phenol, saran, chlorine, vinyl, and cellulose acetate. Thus their programs may be delayed six months instead of the anticipated three.

Extra Special

An official in the War Dept. who knows his business says that several hundred thousand modified versions of the M-52 mortar shell fuse are now on order. It is expected that the actual M-52 will also soon be on order. The new M-82 fuse is for a slightly different type of shell. Another modification is also being tested for rocket fuses; if it is successful, millions of them would be needed in wartime.

The man says: "Pay no attention to past criticisms of the plastic M-52. It was a good fuse and gave good service. In some respects it was better than aluminum. For one thing, a molded plastic surface is smoother and more satisfactory than a machined aluminum surface. The only worthwhile criticism of the plastic M-52 was the necessarily thin walled cuff on the bottom. There seems no remedy for that since we would have to change the size of the pellet which fits inside this cuff if we designed a thicker wall and that is impractical. But by and large we found the M-52 very useful and expect to go on using it."

Polyethylene Supply and Demand

It is a truism as old as time that scarcity breeds demand. And it is perfectly amazing how that truism has worked since polyethylene went on allocation. Requests for polyethylene in October were something like 270% in excess of supply. Unofficial estimates for actual need in excess of demand was about 150 percent. The users put in extravagant claims in the hope that it would bring a larger percentage of actual material but they should have learned by now that such procedure won't work. NPA officials and polyethylene producers have worked out a rather comprehensive program whereby the material is carefully distributed according to historical purchasing records. After DO orders are taken care of, an inflated request for 50,000 lbs. will probably bring the ordering firm no more than if he asked for his actual need for 20 or 30 thousand pounds.

Violaters of Allocation Law Are Caught

One firm went to extremely illegal measures by using a government contract number for food items in an attempt to get polyethylene on a DO order; needless to say they will have to explain this action in court. There has been lots of talk about black mar-

keteering but so far the evidence doesn't indicate that there is an overwhelming amount of either virgin or scrap in the black market. The Compliance Section of NPA has been at work on the job and out of a couple dozen or so complaints only a very few were found guilty and will doubtless be prosecuted.

Along this same line is a warning to molders that resale of unused polyethylene is expressly forbidden without authorization by NPA.

More Polyethylene in October

The amount of polyethylene available for civilian uses in October was increased by a fair percentage since military demands were down; Du Pont is now coming in with somewhat increased amounts after altering their manufucturing procedure to obtain increased production; Bakelite is operating its new plant, but it is not yet at capacity because of inability to obtain small pieces of equipment which, in turn, is holding up full scale production.

The total amount of polyethylene available is not as large as many persons seem to believe. A quick look at the Tariff Commission's monthly production figures where polyethylene is grouped under miscellaneous molding materials along with acrylic, nylon, and a few others of minor volume shows that all these together have been running at only between 5½ and 6½ million lb. a month in 1951. Of course, the major portion of this amount is polyethylene, but it seems reasonable to assume that well over a million lb. monthly is acrylic and nylon.

Civilian Use is 65% of Total

The October allocations of polyethylene were divided percentage-wise as follows: military, 35; essential civilian, 42; turned back to supplier to distribute as he sees fit, 23. It is noticeable that military demand is down 8% from September; it has been going down gradually for several months, but this is in no sense a permanent decline. The military cutbacks in October were due to a decline in packaging and wire coating purchases—the latter brought on by a shortage of metal for wire. It is expected that procurement for military polyethylene coated wire will start going up again very soon and will continue at an ever increasing volume for the next 4 to 6 months, at which time it will level off at a high point. In the meantime, demand for polyethylene in ordnance is increasing. Bottles and carboys haven't yet made much of an impact on the military but they soon will and the result could be devastating to the polyethylene supply line for civilian uses.

Insofar as DO orders for essential civilian items are concerned, they too are on the increase—up to 5% in October over the previous month. There is a troublesome factor here that isn't always understood. It should be remembered that polyethylene film and molded parts are subject to CMP DO orders since they are finished goods and not in the chemical classification where they would be exempt from the orders. Thus, if a man can get metal or foil for wire or packaging on a CMP allocation, he is entitled to extend a rating for the film (but not molding powder) to go with it. Since NPA doesn't allocate polyethylene material to fill CMP DO orders, these CMP orders must be filled by the film producers from the "free" material that they obtain from their suppliers.

Packaging Products Get Most Material

The principal end products obtaining polyethylene for essential civilian goods, according to percentage, were: packaging, 39; wire, 28; mine pipe, 14; camelback, 12. Drum liners for chemical and pharmaceutical goods were placed back on the essential list since they have finally been able to produce a reliable record of their needs. Film, tubing, and wax mixes for frozen food obtained 20% more than the previous month. Material for molding powder in the frozen food field was not increased since the claimant agency, Dept. of Agriculture, claimed they could make polyethylene go farther in other forms than molded containers—that molded containers are primarily utilitarian rather than specifically for frozen food.

Bottles Must Come Out of "Free" Supply

From the percentages above, it can be seen that the material turned back to suppliers for distribution to customers as they see fit after DO orders are filled was more than in previous months, but nowhere near the millions of pounds asked for. An August study of this "free" material indicated that about 85% of it was asked for as packaging material. The demand for material to use for bottles is of course high but the actual number of bottles being produced today is less than in 1950 since almost none of the polyethylene necessary can be asked for on a DO basis.

The general feeling about polyethylene at this time is that somewhat more may continue to be available from the "free" supply over the next few months; that the percentage for civilian essential will go up slightly; that extensive heavier military demand will not take place until beyond the first quarter of 1952. But if Signal Corps procurement is any criterion, military demand will jump erratically from low to high and vice versa depending upon changing procurement schedules.

Price Regulations

Recent rises in the price of polystyrene and phenol are reminders that a price squeeze is now going on in the plastics industry for which there is no apparent remedy under OPS Regulations. There is no way for the user of these materials to adjust his ceiling; he must absorb the price increase himself.

The plastics industry pricing structure is controlled

by several regulations which permit the manufacturer to use a choice of various methods in setting up his price schedule. First there is the General Ceiling Price Regulation effective Jan. 26, 1951, which established ceiling prices for all commodities and services (except a few specifically exempt which have no effect upon plastics) upon the basis of prices in effect during the period from Dec. 19, 1950 to Jan. 25, 1951. Actually, this meant that the ceiling price became the top price which any manufacturer charged for a given product at any time during that period.

CPR 22 Sets Base for Adjustment

The second control order was the Manufacturers' General Ceiling Price Regulation 22 (CPR 22) which permitted the setting up of a price schedule based on costs for the period April 1 to June 24, 1950, or if that period was unrepresentative of his business he could choose any one of the three quarters which preceded it. In other words, the base period for fixing his costs was to be determined by pre-Korea operations, but to those base costs he was allowed to add a percentage cost for raises that occurred in wages and materials.

Many manufacturers chose to stay under the ceiling price established by the General Price Ceiling Regulations rather than change over to CPR 22. For once they came in under CPR 22 they might be subject to roll backs as well as roll forwards for their various products and some of them thought they would fare better simply by staying under the General Ceiling and accepting the price they were using last January as their ceiling. They can come in under CPR 22 whenever they want to anyhow. Thus, those who stayed under the General Ceiling can't raise prices but some of those who came in under CPR can sometimes raise theirs. For example, one plastics supplier might be able to raise his prices for raw materials, but his competitor might not until he comes in under CPR 22 and he might not want to come in under CPR 22 because that would mean he might have to roll back prices on certain, but not all, of his products.

Amendments Make Price Ceilings Indefinite

Under the Capehart amendment, the manufacturer is permitted to compute his selling price on the base period he chooses, but he can add increases in overhead and other expenses as well as wages and materials in figuring his percentage of increase for the new price. The Administration claimed that this amendment practically eliminated the ceiling idea. The Maybank or administration amendment now before Congress would stiffen the regulations somewhat and give OPS a little more leeway in establishing ceilings, but Congress may not enact it before adjournment and even if it does, there is some question about just how much authority OPS is going to have. In addition, it is extremely difficult to set up a ceiling price structure in a time of soft markets when the ceiling might be higher than the market price of a given commodity. But government authorities feel that the soft market won't last long and they want machinery set up so that they can have it ready to function.

Which Regulation Works Out Best?

In the meantime, considerable confusion exists in the plastics industry as to just what course to pursue. One government official stated that many business men do not even know which regulation they are under. The raw material companies have talked about the desirability of a special regulation for their industry, but no action has been taken except by the polyvinyl chloride producers, who have just recently been officially placed under the General Regulations by amendment 30 to CPR 22, October 10, and thus established their ceiling as the highest price charged during the Dec. 19 to Jan. 25 period. Other raw material producers may still be under either regulation.

Most of the proprietary molders base their price schedule on CPR 22.

Custom molders operate largely under Supplementary Regulation 14 to CPR 22 which was issued July 30, 1951, and recently revised. The revised regulation requires that molders file a base period formula and also file a report on any job on which the billing exceeds $10,000. Under the old regulation no filing was required. The revised order also includes a provision requiring the molder to recompute after his initial production run so that his estimated production figures can be compared with actual production figures. If actual production varies more than 5% from the original estimate, the price must be revised.

The coated fabric branch of the industry is controlled by Supplementary Regulation 11 which provides that a manufacturer in determining the ceiling price might optionally exclude the cost of the fabric in computing the proportion of his labor cost to the total volume of his business, and figure his materials cost separately for fabrics and coating. A recent revision removed the time limit of Sept. 4 under which he was required to file Form 8 because of the postponement of CPR 22.

Some Can Raise Price—Others Cannot!

The nub of the over-all pricing problem today seems to be that such things as phenol and polystyrene can be increased in price because the manufacturers can show that their costs are now greater than in the base period or perhaps that an abnormal situation existed in that period. But in the meantime there has been a cut-off date from which period no prices can be increased by the man who uses the polystyrene or phenol. Consequently, he is caught in the middle with no recourse until some change is made.

Some regulation must be drawn up so that these recent raises made by companies newly coming under CPR 22 can be taken into consideration by companies using the newly priced material who want to adjust their ceiling price.

MODERN PLASTICS
VOLUME 29 NOVEMBER 1951 NUMBER 3

THE TABLEWARE WAR

Absurdity of propaganda by Vitrified China Association is shown by an examination of simple facts

Institutions and schools recognized for their contributions to public health through good nutrition are constantly proving the case for plastic tableware

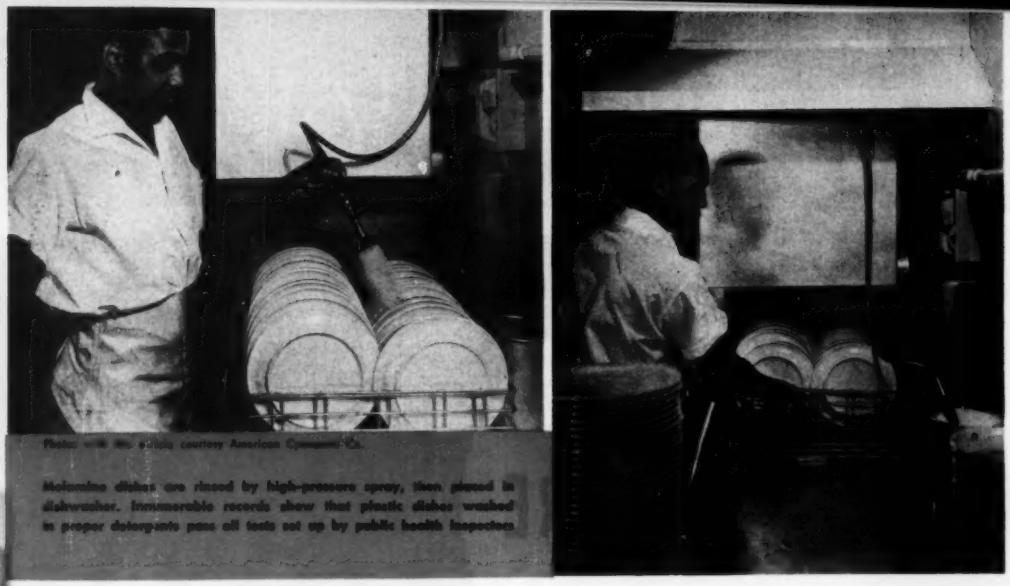
SOME 40 years ago the Association of Buggy Whip Manufacturers (if there was one) might have issued quasi-profound manifestos to all and sundry in support of its members' contention that the horseless carriage would wreck the national economy and the national health—would ruin mankind's nerves, pollute mankind's lungs, and deprive the soil of sustenance.

Absurd, in retrospect, isn't it?

Since its inception, the plastics industry has been subjected in its various parts to numerous attacks, similarly absurd, by interests vested in traditional materials. These attacks are invariably brought on by the fact that the plastic material or plastic product being attacked has taken away a serious piece of business from the materials or products produced by the attackers.

For over three years now, melamine plastic dinnerware has been subjected to attacks by the Vitrified China Association. The first attacks were made on the front of restaurants and other commercial feeding establishments; the second attacks were made through the distributors, to the extent that, in some cases, special distribution arrangements have been made for the plastic product; now the third attack is under way, and the wide front of public health has been selected.

Simple economics of replacement costs, handling costs, and customer satisfaction made melamine tableware manufacturers victors in the first attack. A restaurant owner or any purveyor of meals in the mass simply couldn't afford *not* to use melamine tableware. Logical free enterprise and the distributors' desire for profits helped win the second battle. Distributors simply cou'dn't afford not to handle melamine tableware. And now comes the third attack, on the front of public health, occasioned, we suspect, primarily by the fact that the Quartermaster Corps of the United States Army has accepted melamine tableware for use in Army messes, and is placing fabulous orders. This



Photos with this article courtesy American Cyanamid Co.

Melamine dishes are rinsed by high-pressure spray, then placed in dishwasher. Innumerable records show that plastic dishes washed in proper detergents pass all tests set up by public health inspectors

attack is the broadest and most vicious to date, involving political pressure, and the use of pseudo-scientific propaganda to persuade officials who buy or influence the buying of dinnerware for hospitals, schools, institutions, and military installations, that melamine dinnerware is a threat to public health.

The Finger Points . . .

Prime piece of ammunition in this new attack is a widely distributed "report" entitled "Plastic Tableware and Public Health," by Robert F. Martin, Executive Secretary of the Vitrified China Association. Our reason for editorial rebuttal of the points brought up in this remarkable document is to show the plastics industry in toto, and end users of plastics, the present pattern of attacks on plastics. On the front of public health and public safety, misleading and unethical propaganda gets attention that it would not be accorded on other fronts. As is so often the case when the appeal is to the emotions, the mere pointing of an accusing finger can raise doubts in the minds of prospective users of plastics that only the most vigorous rebuttal can remove.

In the present V.C.A. attack, quotations are liberally used from two pieces of research sponsored by that association, both of which are totally without the official endorsement of the institutions where the "research" was done. One Hal H. Rice, Research Associate at the National Bureau of Standards (but not a member of the regular N.B.S. staff), produced the first piece of V.C.A. ammunition, in the form of two reports. Both these reports concern tests made by Mr. Rice on plastic tableware, but neither of them was ever transmitted officially by the National Bureau of Standards, neither of them was ever reviewed editorially, and neither of them was ever approved for publication by the N.B.S. The use of these Rice reports was coupled with N.B.S. prestige without authorization.

The second piece of ammunition used by the V.C.A. is a report on research conducted by Dr. George J. Hucker on behalf of the V.C.A. at the New York State Agricultural Experiment Station, Geneva, N.Y. This report has no recognition or approval by the institution in which the research was conducted; and according to A. J. Heinicke, Director of the Experiment Station, should not be considered an official publication of the Experiment Station or of Cornell University.

Popularity Breeds Attack

Why has melamine tableware been so successful in commercial feeding use? Why is it becoming so popular in homes? Why has it received the okay of the Quartermaster Corps?

1) Melamine tableware is considerably less fragile than china-ware or earthenware. The dollar savings in breakage represent real economy.

2) Melamine tableware is light in weight, bringing a saving in labor costs for handling.

3) Melamine tableware is quiet —an important factor in restaurants, cafeterias, and institutions.

4) Melamine tableware need not be heated or cooled to keep food hot or cold, because of its low thermal conductivity. No pre-heating means no chance of plates being too hot to handle.

5) Whereas china tableware can be damaged by the unglazed foot of one dish scratching the glazed surface of the one below it in stacking, melamine tableware stacks and stores without damaging itself.

6) If, under extreme punishment, melamine tableware should break, there are no harsh cutting edges left on which hands might be hurt.

7) The soft pastel hues or brilliant colors of melamine tableware are extremely durable; they don't degrade by long use.

Slicing Sales

Naturally, with such a formidable array of advantageous properties, melamine tableware is cutting seriously into sales of vitrified china; and the Quartermaster Corps' procurement, already involving a million pounds of melamine tableware for the Army, is the crux of the attack being made by the Vitrified China Association.

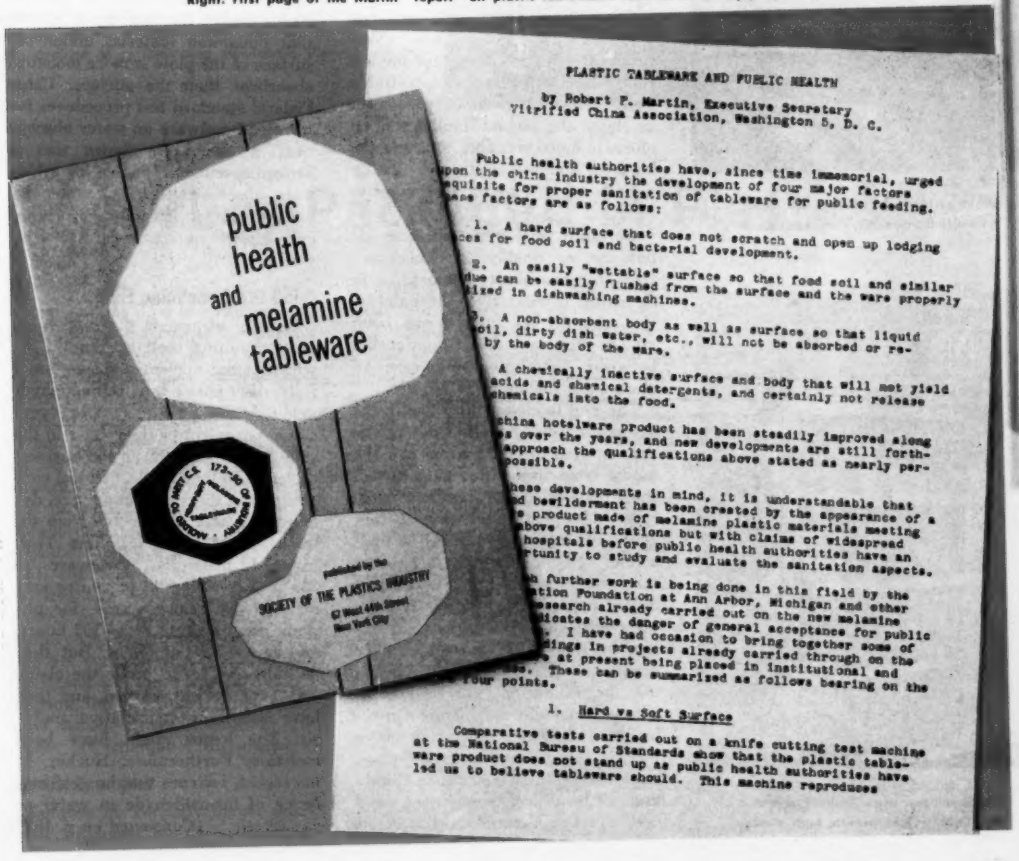
So the V.C.A., out of the "research" reports mentioned above, has ambitions to prove that melamine tableware has: "1) A soft surface that scratches with a knife, opening up lodging places for bacteria; 2) a surface that does not wet properly and hence is difficult to sanitize properly; 3) an absorbent body whereas public health standards for china require a virtually non-absorbent body even under the impervious glaze; 4) a chemically active body which releases formaldehyde (embalming fluid) in demonstrable amounts into warm and hot liquids." And public health officials are being bombarded with these statements.

Melamine has the hardest surface of any plastic material but, admittedly, it can be scratched or rather indented with a sharp knife used under considerable pressure. The resulting indentation is a v-shaped groove, is very shallow, and because the material underneath the surface is the same as the surface, the minute groove cleans readily under normal dishwashing procedures with the use of recognized detergents. Everyone knows that vitrified china scratches, but the difference here is that the hard, thin, and brittle surface actually fractures, exposing broken minute bubbles beneath, so that deteriorated surfaces of chinaware are difficult to clean and are quite likely to retain bacteria. Indeed, at least one chinaware manufacturer is careful to explain to customers the necessity of exercising extreme care in stacking his product, since the unglazed foot of one china plate will scratch the surface of the plate beneath it unless protection is given.

In commercial use, vitrified china doesn't normally last long enough for the scratching effect to become obvious, while melamine tableware, being so much more durable, shows up scratches in time. The V.C.A. is careful not to discuss chipping, a basic fault of vitrified china and one which is of intense interest to public health officials.

Why the V.C.A. discusses breakage of melamine tableware is a mystery in logic; but it is discussed in the Martin report under the same head as surface scratching. Here, the china people want melamine to be subjected to the same thermal shock tests as are applied to china. In these tests, a piece of tableware is heated to 302° F. and plunged into ice water, or heated to 392° F. and put into water at room tem-

Right: First page of the Martin "report" on plastic tableware. Left: Cover of reply by S.P.I.



PLASTIC TABLEWARE AND PUBLIC HEALTH

by Robert F. Martin, Executive Secretary
Vitrified China Association, Washington 5, D. C.

Public health authorities have, since time immemorial, urged upon the china industry the development of four major factors requisite for proper sanitation of tableware for public feeding. These factors are as follows:

1. A hard surface that does not scratch and open up lodging places for food soil and bacterial development.

2. An easily "wettable" surface so that food soil and similar residue can be easily flushed from the surface and the ware properly sanitized in dishwashing machines.

3. A non-absorbent body as well as surface so that liquid food soil, dirty dish water, etc., will not be absorbed or retained by the body of the ware.

4. A chemically inactive surface and body that will not yield to acids and chemical detergents, and certainly not release toxic chemicals into the food.

The china hotelware product has been steadily improved along these lines over the years, and new developments are still forthcoming to approach the qualifications above stated as nearly perfect as possible.

With these developments in mind, it is understandable that considerable bewilderment has been created by the appearance of a new tableware product made of melamine plastic materials meeting the above qualifications but with claims of widespread use in hospitals before public health authorities have had an opportunity to study and evaluate the sanitation aspects.

Although further work is being done in this field by the Sanitation Foundation at Ann Arbor, Michigan and other research already carried out on the new melamine indicates the danger of general acceptance for public use. I have had occasion to bring together some of the findings in projects already carried through on the [illegible] at present being placed in institutional and [illegible]. These can be summarized as follows bearing on the four points.

1. Hard vs Soft Surface

Comparative tests carried out on a knife cutting test machine at the National Bureau of Standards show that the plastic tableware product does not stand up as public health authorities have led us to believe tableware should. This machine reproduces

Both tray loads weigh the same; china dishes at left, plastic dishes at right

When accidents happen, plastic dishes minimize the damage; they don't break

Plastic dishes stack without scratching; light weight permits high stacks

perature. These temperatures are higher than those required by hospitals for sterilization, and appear absurd, because melamine tableware has never been recommended for use as cooking utensils. It has never been suggested by the makers that melamine tableware be placed in an oven or a warming oven; that's not necessary, because (as pointed out above) melamine has low thermal conductivity. On the point of breakage, a much more pertinent test is to drop a melamine plate and a chinaware plate from the same height onto a hard surface, and see what happens!

Wettability Not Cleanability

The Hucker report contains a statement to the effect that the ability of a surface to be wetted is directly related to ease of cleaning; another statement is to the effect that the ability of bacteria and foreign soil to adhere to any surface is almost in direct proportion to the wetting property of such surfaces. The two statements are absolutely at variance. The first implies that, since china is more wettable than melamine, it should be easier to clean; the second implies that, if china is more wettable than plastic, bacteria and soil will more readily adhere to it, making it harder to clean.

Certainly melamine surfaces do not wet as readily as china surfaces, but wettability has nothing to do with comparative cleanability. No scientist yet quoted has been able to prove any direct relationship between wettability and ease of cleaning of melamine tableware.

The key to cleanability lies in the detergent used. Alkaline detergents are reported to give greater soil removal from any product on which they may be used than will acid-type detergents; alkaline detergents are more bactericidal in their action. *But* melamine tableware thrives under cleaning with alkaline detergents, while vitrified chinaware glazes suffer depreciating action by their use. In hospital after hospital, in institution after institution, in restaurant after restaurant, where competent dieticians or intelligent dishwasher operators have been in charge, melamine tableware, washed by proper methods in standard dishwashing equipment and with alkaline detergents, has stood up to every test imposed by health inspectors.

Third major point in the V.C.A. attack is based on water absorption of melamine vs. chinaware. The claim is made that melamine absorbs more water or liquids than chinaware when melamine is tested in accordance with chinaware tests. Now, since a piece of china will weigh 2½ or 3 times as much as a similar plastic piece, and if the water absorption is based on a percentage of weight of such pieces, melamine might absorb 3 times the *percentage* of weight gained by china and still only equal china in *quantity* of water absorbed.

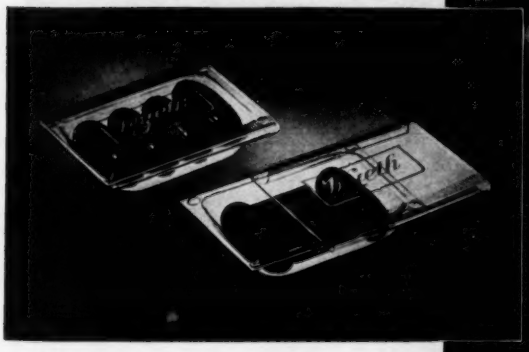
Quoting from the Rice report, the V.C.A. declares that the surface of melamine tableware is water repellent, while the underlying material is more water absorptive, and that this is serious from a public health standpoint in view of the fact that melamine surfaces may be abraded and scratched. But neither Rice's report nor any other proves that melamine material under the surface of the plate is more moisture absorbent than the surface. Using Federal standard test procedures for vitrified hotelware on water absorption, it has been shown that a broken specimen of melamine tableware absorbed 0.88% of water by weight, while an unbroken piece may absorb as much as 1.10% by weight!

Good Old Embalming Fluid

Equally absurd is the final piece of ammunition used by the V.C.A., which is the ancient and long since fully discredited free formaldehyde angle. At one time or another, every crack-pot scientific do-gooder in the country has brought up the business of "embalming fluid." Chemical constituents of melamine tableware, declare the attackers, evolve from the ware in hot air and liquids. They exposed melamine tableware to 230° F.—considerably above recommended use temperatures—for periods ranging from 24 to 192 hours, and found weight losses. But they provide no data to prove the claim, they give no test method, and they have shown no quantitative analysis. The losses might have been moisture. Furthermore, Hucker, in his report, *believes* that he gets evidence of formaldehyde in water at

(*Continued on p. 182*)

Molded transparent styrene drug container has flange at one end of the sliding cover which permits it to be opened in only one direction



Acetate tray designed to hold four capsules can be altered to accommodate only two by the addition of a separating paperboard filler

Drugs Packaged in Plastics

PHYSICIANS' samples of new medications offer a wide variety, large-volume market to the plastics packaging industry. Sending samples to the more than 200,000 doctors in the United States is a promotional operation that represents an annual multi-million dollar outlay on the part of pharmaceutical concerns. Three recent responses to this packaging opportunity are a styrene case, an acetate tray, and a polyethylene pill box.

All three of these materials are odorless and non-toxic, thus preventing any chemical reaction between package and drug; the packages are economical to produce and are strong and not easily broken. In addition, the containers are compact units which can be carried in the pocket for emergency dispensing.

Specific Examples

Samples of Terramycin, an antibiotic produced by Chas. Pfizer & Co., Inc., Brooklyn, N.Y., are packaged in a transparent styrene box with sliding cover. The container is molded by E. B. Kingman Co., Leominster, Mass., with six individual wells to hold six 250 mg. capsules.

The acetate tray with sliding cover is used to package two vitamin products—Minules and Sevetol—manufactured by Wyeth, Inc., Philadelphia, Pa. Formed by Plastic Artisans, Inc., White Plains, N.Y., the shallow tray measures 1⅝ by 1¼ inches. The cover is a flat acetate sheet with the two side edges crimped over to engage with the rim of the tray.

The container holds four capsules of the Minules or two of the Sevetol. When it is used to package the Sevetol vitamins, a paperboard filler is placed between the two capsules.

Schering Corp., Bloomfield, N.J., manufacturer of endocrines and pharmaceutical preparations, has recently introduced a polyethylene pill box as a sample container.

The entire container—including catch, self hinge, compartments, and simulated leather grain—is injection molded in one operation by Auburn Button Works, Inc., Auburn, N.Y.

Molded polyethylene box features self hinge and individual pill compartments

Courtesy Auburn Button Works, Inc.

Styrene ring is part of shampoo bottle closure; when flipped to one side it releases pin so that contents of bottle can be squeezed out

Polyethylene thong slipped through slot in styrene ring closure is provided so that the bottle can be conveniently hung in the shower

Toiletries Dramatized

Effective use of plastics extends from styrene front on showcase through polyethylene bottle with styrene closure ring to travel kit fabricated of vinyl

Theme-styled showcase has molded styrene front, molded-in fin and shelves

FOR its entry into the men's toiletry field, Max Factor Hollywood chose three plastic materials—styrene, polyethylene, and vinyl—to spark an effective presentation of a new line of grooming preparations. Marketed as "Signature by Max Factor Hollywood," the line is comprised of five toiletry articles—Shower Shampoo, Cream Hair Dressing, After Shave Lotion, Deodorant Cologne, and Lazy Shave.

Integral part of the marketing program is a showcase with an injection-molded transparent styrene front in which all five Signature products are displayed with striking point-of-sales appeal. The styrene front has a vertical fin which supports two horizontal shelves. Both the fin and shelves are molded-in.

The shape of the showcase—wide top that tapers down to a narrower base—combines both utilitarian and aesthetic considerations. The narrow base takes up less counter space, and the over-all design, suggesting a stylized male torso, is trim and attractive.

Molded by Peerless Plastics, Culver City, Calif., the styrene piece weighs 33 oz., and is said to be the largest single injection molding yet made on the West Coast. It is 14 in. across the shoulders, 11 in. wide at the base, and 19 in. high. The entire display unit is deep enough to provide ample storage space. A silk screened styrene sign on top of the case is cemented to the styrene front.

Shower Shampoo, a new toiletry article of its kind for men, is marketed in a squeezable polyethylene

bottle with an unusual closure. Designed with the same wide-shouldered, tapered shape as the showcase, the polyethylene container fits the hand when upright as well as when tipped, since, in profile, the bottle is wider at the base than at the top. This construction also gives the bottle added stability. Molded by Plax Corp., Hartford, Conn., the container is green and has molded-in lettering.

Attached to the bottle is a specially designed closure unit which keeps the shampoo from spilling or becoming diluted if the bottle is left open and which eliminates the problem of a separate cap.

The closure has two separate component parts—a transparent styrene ring injection molded by Eldon Mfg. Co., Los Angeles, Calif., that pivots in holes in the neck of the bottle, and a polyethylene plug molded by Owens-Illinois Glass Co., Toledo, Ohio. The plug, located in the bottle neck, contains a spring and screw-machine pin held to very close tolerences. Utilizing the flexibility of the polyethylene to spring-load the rigid closure ring, the ring is flipped to one side with the thumb. This releases the pin and allows it to pop up; the shampoo flows out when the bottle is squeezed. By returning the ring to its vertical position, the pin is depressed and a pressure-tight seal is formed.

Fastened through a slot in the top of the closure ring is a ¼-in. wide polyethylene thong extruded by Visking Corp., Chicago, Ill. The thong is hung from the shower.

When sold as a unit, the five toilet articles in the Signature line are packaged in a travel kit that contains four 4-oz. polyethylene bottles for the liquid preparations and a box of talcum. The bottles are fitted with spill-resistant neck plugs and white styrene closures compression molded by Victor Industries, Brooklyn, N.Y.

Bottles Refillable

Because the kit is designed for repeated use, the polyethylene bottles are constructed for ease in refilling. A special siphoning device is provided in the kit for that purpose. The siphon is a polyethylene tube extruded by Calmar Co., Los Angeles, Calif. and is attached at one end to a polyethylene plug molded by Plax Corp.

Refilling the polyethylene bottles is a simple procedure. First the neck plug in the empty bottle is removed (it can be loosened with the side of a nail file), and the plug end of the siphon is inserted in the plastic bottle. The tube itself is placed in a standard glass refill bottle. By squeezing and releasing the polyethylene container, the desired amount of liquid is drawn in from the glass bottle.

To accommodate the polyethylene bottles in the travel kit with no waste space, their shape departs from the wide-shoulder, reverse-taper design. Plax Corp. molds them with straighter side contours.

The kit itself, fabricated by A'Cadia Cosmetic Kit Co., New York, N.Y., is made of leather-grained vinyl and lined with twill-like vinyl.

To refill squeeze bottle, neck plug of the empty container is first removed

Polyethylene tube with plug is used to transfer liquid from refill bottle

With plug inserted in travel kit bottle, liquid is transferred by squeezing

New toiletries for men are also sold in 4-oz. polyethylene squeeze bottles packed in travel kit made of leather-grained vinyl

Rails Rest on Polyester-Glass

Photos courtesy Dynakon Corp.

First step in manufacture of polyester-glass tie plates—blending resin and filler by use of propeller-type mixer mounted on drum. Catalyst is added to resin mix at this stage

The resin mix, in measured quantities, is placed in cavity of matched metal die; previously shaped glass preform is placed on resin. Die pressure distributes resin evenly

A railroad tie plate leads a rugged life—so rugged that even heavy steel tie plates do not last long. Thus the railroads are interested in other materials for this tough application. The most recent answer to their problem is a material which has proved itself tougher than steel in other applications—polyester resin and glass mat.

Tie plates made of Fiberglas and polyester resin are now being manufactured by The Dynakon Corp., Cleveland, Ohio, and have been installed for service tests on tracks operated by Erie Railroad, which cooperated with Dynakon in the development of the plastic plates.

If the plastic plates are generally adopted by U.S. railroads, they will result in substantial savings in maintenance costs because of their longer life and lighter weight. They will also result in a smoother ride for railroad passengers and will greatly reduce the need for steel.

Properties Required

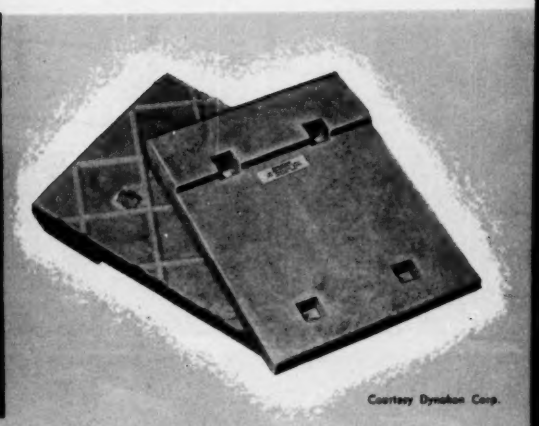
A tie plate is about 1 ft. sq. and is sandwiched between the rail and each wooden tie on a railroad. The function of the plate is to distribute the pressure put on the rails by the weight of the train so that the steel rail will not cut into and destroy the tie. The ideal plate must not only be capable of standing the tremendous weight of the rail and trains, but must also be able to resist weather, rust, and corrosion. The latter is a particularly acute problem because of the salt brine drippings from refrigerator cars. The polyester and glass mat plate is resistant to attack of brine, acids, and oils.

The tie plates are staked down with heavy spikes and therefore may receive direct sledge hammer blows during installation—or later when the spikes are being tightened. One such direct blow can break a rusted steel plate. The Dynakon plastic plate has withstood repeated deliberate blows of sledge hammers.

Besides being durable, the plastic plate has the advantage of weighing about one-fourth as much as a steel plate. This reduces ship-

Courtesy Erie Railroad Co.

Polyester-glass tie plate (left), weighing one-fourth as much as the common steel plate (right), reduces shipping costs and simplifies handling



Courtesy Dynakon Corp.

Front and back view of plate, showing spike holes molded in, but not through. Thin web at bottom can be pierced by spike

ping costs and simplifies handling. The saving in shipping costs can amount to a sizable sum because of the volume involved. The railroads of the United States bought 40 million tie plates last year. If all of these were plastic instead of steel, a 300 million lb. weight saving would be effected. If the average plate is shipped 100 miles (a conservative estimate) the total saving in shipping costs alone would be $375,000.

Because of their resilience, the Dynakon plates tend to make for smoother riding. They also reduce the noise level by eliminating the metal-to-metal clatter between rails and tie plates.

A specially formulated unsaturated styrene copolymer material was developed to get the unusual physical strength qualities necessary for this application. The Dynakon plate has a tensile strength of 29,000 p.s.i., and Charpy impact strength of over 20 ft.-lb. Attainment of these physical properties was the most difficult hurdle to overcome in the development of the plastic tie plates. A powder filler material is also used to reduce water absorption.

Method of Production

The first step in the manufacture of the plate is the blending of resin and filler, using a propeller-type mixer mounted on a drum. The catalyst, benzoyl peroxide, is also added at this time. A measured quantity of the resin mix is then placed in the cavity of the matched metal die, and the glass mat preform, previously punched out to shape, is inserted on top of the resin.

Uniform resin distribution is effected by die pressure, and the small amount of excess resin is displaced through an annular groove between the male and female parts of the mold.

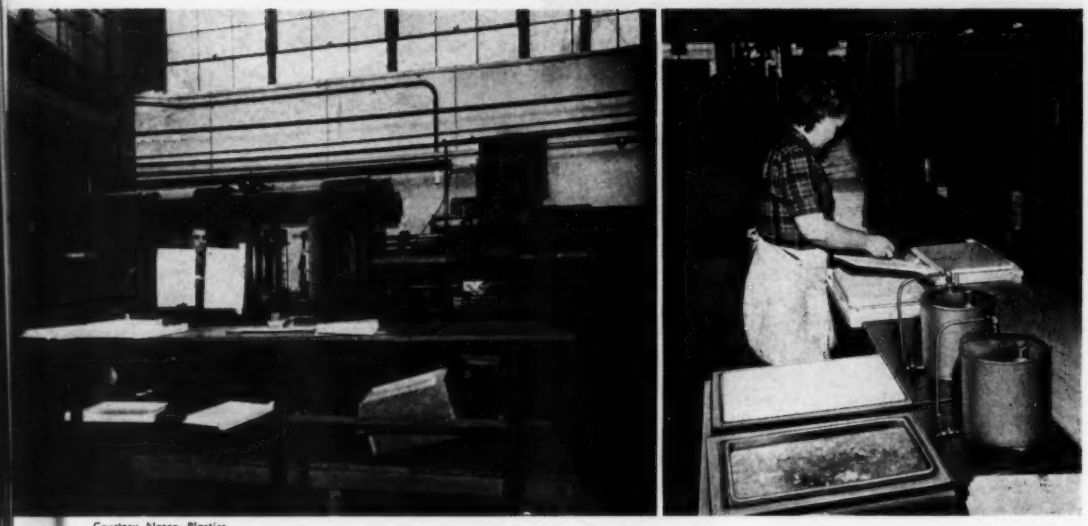
The plate is molded on a cycle of about 1 min. at 250° F. and 50 p.s.i. pressure.

Holes for track spikes are molded-in to the tie plates, but are not molded through. The thin web at the bottom of each hole can easily be pierced by the spike.

Laying test track to check durability and corrosion-resistance of tie plate

Photos courtesy Erie Railroad Co.

Polyester-glass tie plates under locomotive wheels. Plate's resiliency helps make for smoother riding



Courtesy Nosco Plastics

Left: Producing matched baffle parts in two-cavity die on 60-oz. machine. Shot is only 42 oz., but projected area of over 500 sq. in. requires high clamp pressure. Right: Insulation is cemented between halves; baffle will be held under pressure to insure bond

Multi-Cavities for Big Machines?

Opinions pro and con on the economies of using multi-cavity dies to be run on injection machines of 60-oz. capacity or larger

A few months ago, the work of large injection machines was surveyed in these pages (see "Big Injection Machines," MODERN PLASTICS 28, 71 (July 1951). That survey was limited to the production of larger and/or heavier pieces in single-cavity dies. The manner in which the machines of 60-oz. capacity and larger can be and are being used for multi-cavity operation is discussed in the accompanying supplementary article.

CAN big injection molding machines (that is, those of 60-oz. capacity or larger) be used economically to produce small pieces in multi-cavity dies? That question cannot yet be answered fully because sufficient experience has not accumulated; molders differ widely in opinions, many of which are based more on theory than practice.

At one end of the scale among molders with large machines is one who is setting up a 60-oz. machine to turn out 272 pieces per shot. At the other extreme are those who believe that the large machines are suitable only for turning out larger or heavier pieces than can be produced in smaller presses. One of the latter group, when asked his opinion of the 272-cavity set-up, said: "I think the man must be nuts."

As is usual when opinions differ so widely, the truth seems to lie somewhere in between. Some pieces can be produced more economically in multi-cavity molds on the big machines than in single-cavity molds in smaller machines. But this is only true with certain types of pieces and only to a certain extent. Two-cavity, four-cavity, and even six-cavity molds have been run on the big machines. But there is a point of diminishing returns beyond which a multi-cavity mold for a 60-oz. or larger machine becomes less economical than a number of single-cavity molds on smaller machines.

The big machines have not been in use long, and have seldom been used for multi-cavity operation. On the other hand, the economics of multi-cavity operation with machines *up to* 60 oz. (as against single-cavity operation of still smaller machines) is another question entirely. It is largely affected by the fact that the really small machines (such as 2-oz. and 4-oz.) can be operated completely automatically.

Reasons for Multi-Cavity Work

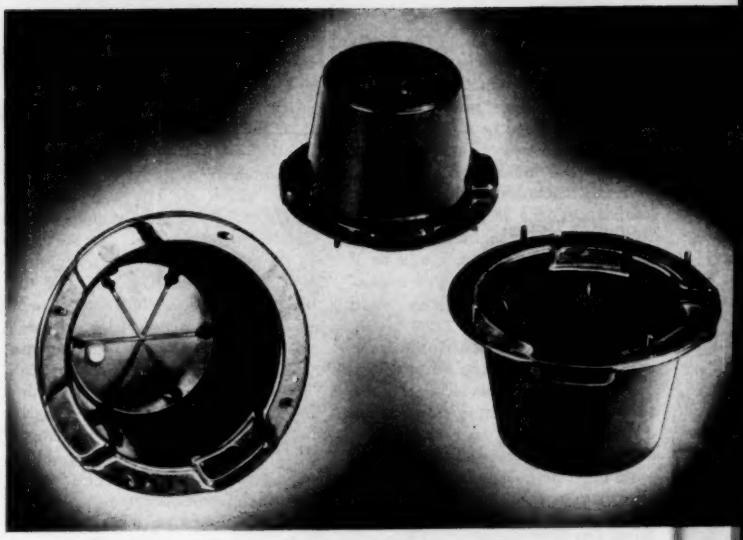
As far as the machines of 60 oz. and over are concerned, the main argument for multi-cavity work is the decreased labor cost per piece. A piece of about 20 oz., for example, could run on a 20-oz. machine and turn out three of the pieces per shot.

The comparative molding cycle depends upon a number of factors, such as the design of the piece, the method of gating, whether or not

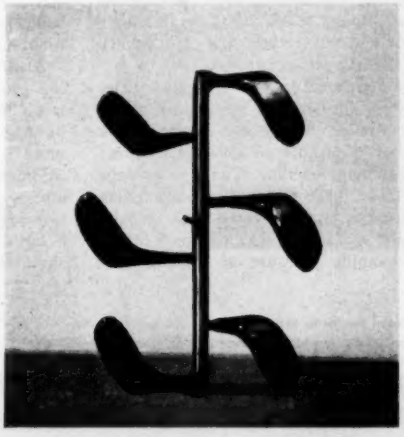
the piece comes near to the capacity of the machines, etc. But in any case the molding cycle for the multi-cavity die on the large machine is less than the time required to mold the same number of pieces in single-cavity dies on any machine. Sometimes it is even possible to mold two pieces in only a few seconds more than is required to mold one piece on a smaller machine.

Thus the machine time required per piece is less with the larger machines. Of course, the cost of machine time on the larger machines is greater. But if there is enough difference in cycle to make up for the difference, use of the larger machines may even result in a lower machine time cost per piece.

Another argument for multi-cavity operation of large machines applies specifically to pieces which are close to the capacity of the small machines on which they could be run if run in a single-cavity die. Take, for example, a 45-oz. piece which could be molded in a single-cavity die on a 48-oz. machine. Because the piece comes close to the capacity of the machine, the reject rate is likely to be high. Many molders would therefore prefer to run the piece in a two-cavity die on a 120-oz. machine and will argue that the reduction in reject rate alone, resulting from the additional clamping pressure and injection capacity available, would more than justify the increased mold cost and cost of machine time.



Acetate T.V. tube cover molded in four-cavity die run on 100-oz. machine. Cost of the multi-cavity die was less than for separate dies; cycle is about the same



Courtesy Prolon Plastics Div., Pro-Phy-Lac-Tic Brush Co.

Modified styrene copolymer golf club heads, produced in a six-cavity die, as taken from the mold. Each shot weighs 4 pounds. Mold is run on 120-oz. machine

Against

Those who argue against the use of the large machines for multi-cavity molding point out first of all that the question of a multi-cavity die in a 120-oz. machine versus a single-cavity die in a 48 is not the same question as, for example, multi-cavity operation of a 20-oz. machine versus single-cavity molding on a 4-ounce. Although the general principles involved in both questions are the same, the former deals with machines and pieces so large that new complications must be considered.

For example, the pieces may be so large as to create unloading difficulties if molded in multi-cavity dies. If the shot is so unwieldy as to necessitate two operators to remove it from the machine, the advantage of lower labor costs disappears. Furthermore, a two-man unloading operation could slow up production.

Another difficulty may crop up in the question of utilizing the operator during the molding cycle to degate and/or finish the molded pieces. A large machine turning out many pieces on a fast cycle may turn out more than the operator can degate or finish during the cycle. Thus finishing would become a separate operation and require additional labor, again wiping out labor cost saving effected by using a big unit.

Perhaps the argument most often used against multi-cavity work in big machines is that of mold costs. But in the case of non-identical parts (such as two parts of a freezer baffle), the question becomes two single-cavity molds on small machines versus one two-cavity mold on a large machine. In such a case, there is likely to be little difference in costs. Although the duplication of some expense is avoided by combining the two dies in one, extra expense is incurred because a non-standard mold base must be pur-

chased and large die plates must be machined.

A factor in comparative mold costs is the production rate required. If a large number of the pieces are needed in a short time, it may be necessary to make several single-cavity molds to fill the order on small machines. Under those circumstances, the larger mold to be run on a large machine may not be so far out of line as it would be if the time element were not important and one single-cavity mold could handle the job.

It should be mentioned that some molders are opposed to large multi-cavity dies for one other reason than costs. They argue that such a die is too much of an all-the-eggs-in-one-basket proposition. If the mold must be pulled for any reason, all production stops.

What Has Been Done

Turning from theory to practice, there seems to be only about a half dozen examples of multi-cavity molds now running on machines of 60-oz. capacity or more. And three of these molds are turning out matching (rather than identical) parts in two-cavity dies.

For example, Nosco Plastics, Erie, Pa., is producing a two-part Westinghouse refrigerator baffle in a two-cavity die on a 60-oz. Watson-Stillman machine. The shot is only 42 oz., but the two styrene parts have a total projected area of over 500 sq. in., and thus can well utilize clamping pressure of the big machine. The mold runs on a cycle of about 1¾ min. and the molder figures that the two parts would require one minute each of run in separate single-cavity molds.

Nosco has also run a two-cavity breaker strip mold on its 60-oz. Watson-Stillman. These styrene parts, which are about 48 in. long, had previously been molded on a 24-oz. machine by letting the ends of the mold extend over the platen. The extra injection pressure of the 60-oz. machine was found to be necessary to fill the cavities and develop surface luster on a special run using high impact styrene material.

Refrigerator baffle parts have also been produced in two-cavity dies in the Decatur, Ill., plant of General Electric. One mold, which produces two styrene baffle tops, each 9½ by 22⅜ in., is running on a 60-oz. H.P.M. machine on a 50-sec. cycle. The total shot weighs 32 ounces. There is a center sprue between the two cavities with four parallel runners to the inside edge of each piece. The gates are rather wide, but flat. The bottom pieces of the baffle are produced in a similar mold on another 60-oz. H.P.M.

Another styrene part which is being produced in a two-cavity mold is an RCA television mask molded by A. L. Hyde, Grenloch, N.J. This piece is run on a 200-oz. Watson-Stillman, and each shot weighs 75 ounces. The two-cavity operation was adopted because of the need for a large number of the pieces in a short time. The alternative would have been two separate one-cavity molds. Hyde estimates that the production rate of the two-cavity mold is about 30% higher than that of two separate molds.

An example of a four-cavity mold running on a large machine is a television tube cover being molded for RCA by Mack Molding Co., Wayne, N.J. The hat-shaped brown acetate piece covers the part of the television tube which sticks out of the back of the cabinet. Each piece weighs about 7 oz., but RCA wanted so many parts per day that four cavities were indicated. The job was thus figured to run in four one-cavity molds to run on 8-oz. machines and in one four-cavity mold to run on a large machine. The four-cavity die was less costly than four separate dies, and the cycle was about the same either way. Mack thus decided to run the job in the multi-cavity mold on one of its own 100-oz. accumulator-operated vertical injection machines.

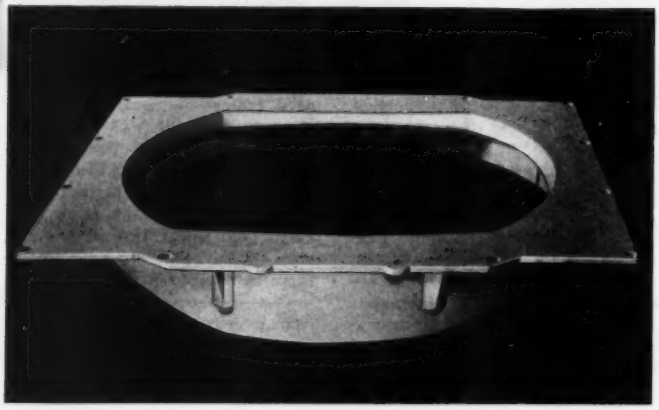
Over Four Cavities

As of the date of this writing, only one mold with more than four cavities has ever been run in actual production on a machine larger than 60 ounces. That mold is being run by Prolon Plastics Div., Pro-Phy-Lac-Tic Brush Co., Florence, Mass., on a 120-oz. Watson-Stillman. It is a six-cavity die and produces Plexene golf club heads. Each shot weighs 4 pounds.

What of the future? Will molds with eight, ten, and more cavities be run in the big machines often? The answers are not yet clear. As mentioned at the beginning of this article, one molder who believes that they will is now setting up his 60-oz. H.P.M. machine to run a 272-cavity die. The set-up involves a 140-cavity picnic spoon mold and a 132-cavity fork mold which will run simultaneously. The total shot would be about 2½-lb. and the cycle will be about 45 seconds. The molder is firmly convinced that he will be able to produce styrene picnic forks and spoons this way at a cost far below that of molders using smaller machines and fewer cavities.

Can this actually be done? Is six cavities the upper economical limit of the big machines or is that limit somewhere between six and 272? Nobody can say definitely until he has tried.

Need for faster production was reason for molding styrene T.V. masks in two-cavity die on a 200-oz. machine. Production was estimated to be 30% higher than with separate molds
Courtesy A. L. Hyde



Tough Tote Trays

TOTE trays molded of high impact phenolic carry precision parts for artillery shells safely and efficiently through various assembly line operations at the plant of Sargent & Co., New Haven, Conn. The phenolic molding compound—RX-429, supplied by Rogers Corp., Manchester, Conn.—has an Izod impact strength of 0.8 ft.-lb. per in. of notch.

Because of this high impact strength, the phenolic trays are able not only to stand up under the rough treatment to which they are subjected on the assembly line, but are also able to withstand the weight of a pile of other filled tote trays when they are stacked. Yet they are light enough to be handled by one operator. In addition, the material itself can withstand the cleaning operations which the parts undergo while in the tray—immersion in hot water with a detergent, and exposure to a blast of steam.

Each part, a machined brass component with external threads, nests in an individual molded-in hole in the tray. These holes (there are 25 of them in each tray) are carefully measured to permit the parts to ride in balance and not spill, thus protecting the delicate threads. Walls and nesting recesses are high enough to prevent contact between parts in one tray with those above or below when stacked.

The trays are custom molded by Teal Molding Co., Inc., New Haven, Conn., in a compression mold, using preforms which are electronically preheated. After molding, flash is removed and the holes are cleaned with a shaped stone. By using interchangeable pins in the mold, it is possible to vary the diameter and shape of the holes.

Molded tote tray is removed from press. Material used is high-impact phenolic; interchangeable pins in the mold make it possible to mold-in holes having different diameters and shapes for various uses

A shaped stone chucked in a drill press is used to remove flash from the molded-in holes and to smooth the edges. Wall thickness is 3/16 in.; bottom is 5/16 in. in thickness

Photos courtesy Rogers Corp.

Tote trays for carrying precision parts along an assembly line have to be able to withstand rough handling as well as stacking weight. Design of bases and nesting recesses prevents contact between parts in adjacent trays

SIGNS THAT STICK

Colorful vinyl signs made for point-of-sale display require no adhesive. They are simply pressed against a smooth surface where they adhere indefinitely. Views above, taken from both sides of a glass window, show how easily the signs can be removed

COLORFUL point-of-sale advertising signs that will stick to any smooth surface are now being made of cast vinyl plastisol sheeting. The signs, made by The Ad-Stik Co., Pittsburgh, Pa., offer many advantages over the decals or paper stickers usually used on store windows, back bar mirrors, or showcases.

Presses On, Peels Off

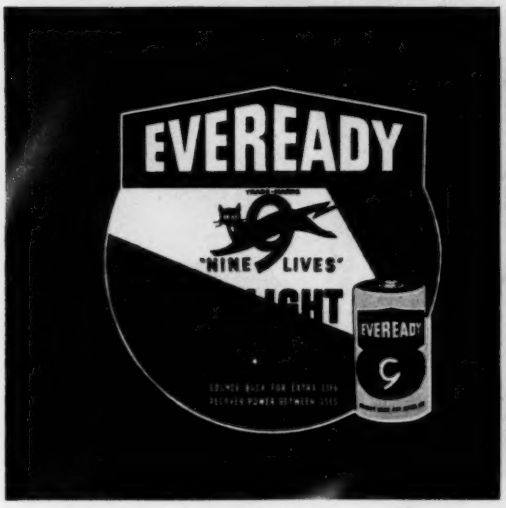
The smooth surface of the cast vinyl sheet can simply be pressed against a smooth surface, and the sign will adhere to it indefinitely without the use of glue or any other adhesive. This can be done on such surfaces as glass, polished wood, metal, baked enamel, leather, acetate, or coated paper. The sign can be removed easily at any time by lifting one corner of the vinyl with a finger nail and peeling off the rest. No razors or other tools are needed, no scraping is necessary, and the sign leaves no mark on the surface on which it was used. In fact, the sign can be reused repeatedly. Thus it is suitable for temporary but day-after-day uses, such as a "Breakfast Being Served" sign on a restaurant window.

Ad-Stik signs are die-cut to shape and can be printed in full color to duplicate a trade-mark, package, or even the product itself. The printing is done with vinyl inks so that it becomes fused with the surface of the sign and cannot rub off. The printed side will stick to a smooth surface as readily as will the unprinted side. Thus the sign can be used on the inside of windows as well as on outer surfaces.

The signs can also be printed on both sides so that the message can be read from either side. An important use of this feature is on the glass doors of stores. The admonition to buy the product can be printed on one side and "Thank you, call again" on the other side. The Eveready battery sign illustrated is an example of such a use.

Competitive with Decals

In quantity, the colorful plastic signs are about the same price as decals, and in some cases are less expensive. And they are easier to put



Self-adhesive vinyl signs can be printed on both sides (as in the examples above and on the opposite page) or on one side only. Signs printed on both sides are ideal for use on store doors where they can produce a double sales impact or deliver two different messages

up, can be removed and reused, will last far longer, and can be washed when dirty. Unlike paper stickers or decals, which tear easily, Ad-Stik signs are so strong that they can hardly be torn by deliberate effort.

Because of the wearing qualities of vinyl, Ad-Stik signs are unaffected by weather. They will take prolonged exposure to sunlight, rain, snow, or low temperatures. For example, they can be used on the inside of frozen food display cabinets —a location where no other type of sign will stick.

Places can be left blank on the signs so that the retailer can mark in the price of an item with a China marking pencil. Such markings can be wiped off and changed whenever necessary.

After violent stretching, this sign returned to its original shape. The printing was undamaged

Signs are delivered on paper sheets on which simple instructions are printed

Applications

Many large manufacturers have adopted Ad-Stik signs in various forms. The Eveready door sign has already been mentioned. Another door sign consists of the words "Don't Forget" in white on a red arrow pointing to a full-color reproduction of a package of Camel cigarettes. Among the other packages which have been duplicated are those for Glass Wax and Nucoa oleomargarine. Another interesting Ad-Stik is a full-size, full-color reproduction of a Leica camera.

Some advertising uses of self-adhesive vinyl signs involve the production of multiple units which can be arranged on windows, back bars, and the like in a variety of patterns

Plastics in Harp Provide TONE INSURANCE

Harpists find that the nylon strings on new Irish harp equal gut in tone but require less frequent retuning

Reinforced plastic harp parts are light weight, strong, resistant to moisture

Concert harp sounding board is sealed with decorated cellulose acetate sheet

BY incorporating nylon strings and a reinforced fibrous glass shell in its small Irish harp, Clark Music Co., Syracuse, N.Y., is able to produce an instrument, the tone of which remains unaffected by changes in temperature and humidity. The company claims the plastics parts render the harp 100% moisture resistant. It has even been played under water!

Matching the tonal perfection of conventional gut, the nylon strings eliminate the necessity for constant retuning to readjust to changing atmospheric conditions.

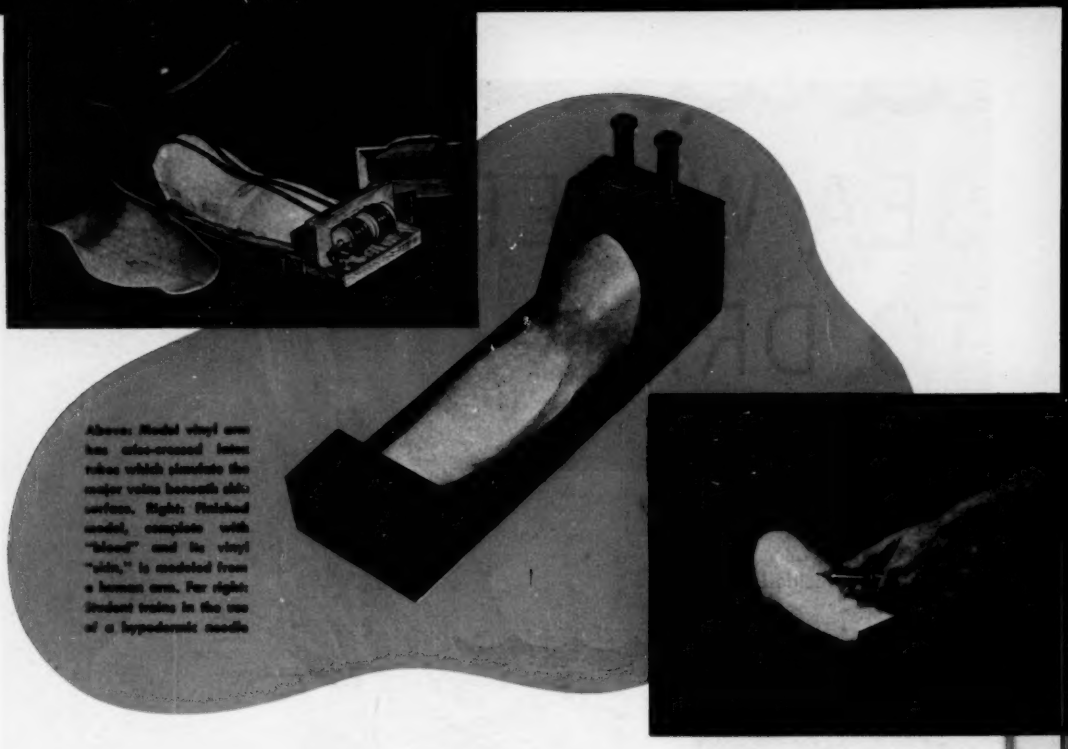
E. I. du Pont de Nemours & Co., Inc., produces the strings by extruding nylon through a die to a predetermined thickness. After extrusion, the strings are unwound from a slow-moving spool onto a faster-moving spool; the draw is 25 percent.

The strings are then shipped in 1000-ft. rolls to Clark Music Co. where they are cut to required lengths and subjected to steady tension for 10 days. The stress on each string is relative to the tension to which that string will be subjected on a tuned harp. Then the strings are strung on a harp, stretched manually, and tuned a little above pitch, or at greater than normal tension. They are retuned and restretched each day for 10 more days in a "settling" process, which makes it possible for the nylon strings to hold their final pitch for long periods of time.

The extruded nylon strings have a uniform cross section and will not fray or become rough during constant use. Because their tensile strength is seven times greater than that of gut strings, the danger of string snapping while playing is substantially decreased.

The choice of resin-impregnated fibrous glass for the shell is the result of years of experimentation. Tin, steel, and wood were all discarded in favor of reinforced plastic, which proved superior in resonance, strength, lightness, and resistance to moisture. The hollow shell is molded under low pressure and laminated with the grain oriented to present maximum resistance to the stresses imposed by the strings. The casing varies in thickness from 1/16 in. at the top of the shell to 1/8 in. at the bottom. It is 25 in. long, 3 in. wide and 1½ in. deep at the top, and 7 in. wide and 4½ in. deep at the bottom.

The company is also experimenting with cellulose acetate to cover the wooden sounding boards on its concert harps and thus make them moisture resistant. During construction, the moisture content of the sounding board is reduced to 3½ percent. Then the wood is warmed, glue applied, and 1/64-in. sheets of cellulose acetate bonded on under heat and pressure, completely encasing the top, bottom, and sides. Thus sealed, the sounding board is more durable, and will not dry, split, or warp.



Model Arm has Vinyl "Skin"

A MODEL arm, covered with a vinyl "skin" and complete with simulated vessels and blood, is now being employed to train naval personnel in the use of the hypodermic needle. Developed by Commander J. V. Niiranen (DC) USN, at the Maxillofacial Prosthesis Dept., Naval Dental School, Bethesda, Md., the model arm is more realistic than the training devices formerly used.

With this model arm, trainees can be taught to locate blood vessels by palpation; to administer injections through the vinyl skin, which offers a realistic resistance to penetration; and to draw and type blood.

The surface contour of the training device duplicates that of the inner forearm and elbow. Under the top layer of vinyl "skin" is a network of rubber latex tubing which approximates the vein structure. These "veins" rest on a layer of ½ in. thick felt placed over a plaster or dental stone model of the forearm. This entire unit is mounted on a Formica frame.

To form the vinyl skin, a thick liquid vinyl preparation is brushed over a one-piece linotype metal mold and cured against the mold. The preparation is a Bakelite Co. vinyl base which has been processed by Nelson & Cramer Co., Royal Oak, Mich., and pigmented. The metal mold for this operation is the final mold derived from a series of impressions of a human forearm.

Texture of the vinyl skin can be altered by beating air into the vinyl formulation; by varying the curing temperature; or by brushing on different thicknesses of vinyl over the metal mold. By using any one of these processes, a vinyl skin can be produced that approximates any human skin texture.

Directly below the vinyl skin are two rubber latex tubes which are criss-crossed to simulate major veins in that area. The lower, or wrist, end of each tube is wound on a spool which provides replacement lengths that can be pulled through to the upper, or elbow, end as required. The upper ends of the tubes are connected to two 20-cc. syringes, which are mounted on the outside of the Formica frame. These syringes, as well as the tubes themselves, are filled with red liquid, and they register the amount of fluid which is withdrawn or inserted in the veins. Liquid level in the syringes falls when fluid is withdrawn, and rises when an injection is given.

The felt below the vein structure prevents the point of the hypodermic needle from hitting the plaster, or stone, cast of the arm. It is this cast that gives bulk and contour to the model. Because the felt has a certain amount of traction, the veins do not slip around, and thus are easily located by trainees.

For advanced training in needle technique, sponge rubber is substituted for the protective felt lining. The rubber, together with the inside of the vinyl skin, is lubricated so that the veins become slippery and more difficult to locate.

SEA WATER TO DRINK

Redesigned desalting unit has parts made of rigid and flexible vinyl sheet as well as molded rigid vinyl

Desalted sea water can be drunk through filter outlet in bottom of bag made of 12-gage vinyl. Bag holds 18 oz. of water at one time

"WATER, water, everywhere, nor any drop to drink." That ancient problem is still the number one problem of military personnel who are forced down at sea and must survive on a raft for any length of time. The World War II solution to the problem was a portable desalting kit, made by The Permutit Co., New York, N.Y.

An important part of this kit, the vinyl bag in which the water is desalted, has recently been redesigned to make it more compact and with a better closure than the World War II model. The redesigned bag is also an interesting combination of flexible vinyl, rigid vinyl sheet, and molded rigid vinyl.

The Permutit Desalting Kit makes use of briquets of desalting material which are placed in the vinyl bag with the sea water. Each briquet of a special ion exchanger made by Permutit is the size of a small candy bar and will desalt 18 oz. of water. The mixture of sea water and ion exchanger is agitated occasionally for about 45 min., during which time the salt is removed by precipitation base exchange. The fresh water can then be drunk through the filter outlet at the bottom of the bag.

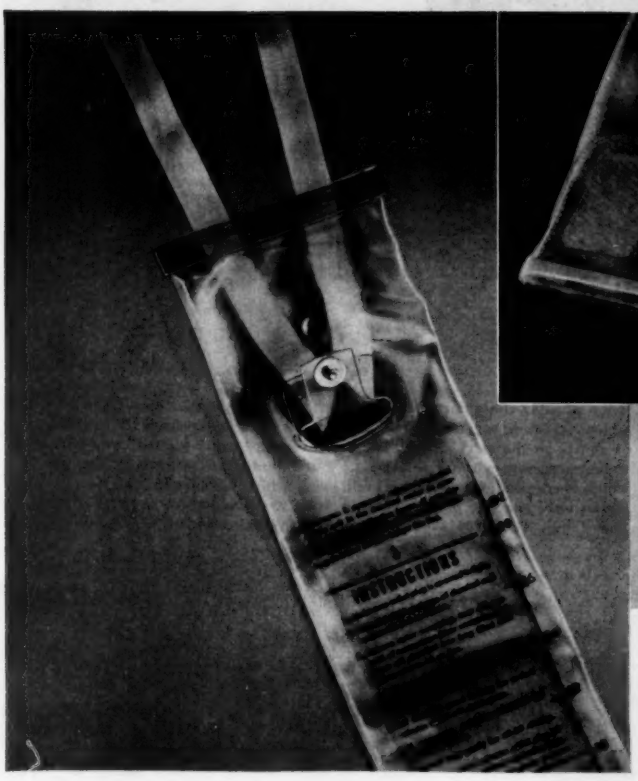
The bag is made for Permutit by Viplax Products Corp., Beverly, N.J. It is fabricated of 12-gage flexible vinyl sheet and is open at the top. After the water and briquet have been inserted, the bag is closed by rolling the top down and fastening a snap. The snap fastener effects a more reliable closure than the strap and buckle used on the World War II bag.

Construction of Bag

The first step in making the bag is to cut a 15- by 7-in. piece from vinyl sheet. Before this piece is folded and sealed to make a bag out of it, two 0.030-in. thick rigid vinyl pieces, each 1 in. sq., are heat sealed to the side of the sheet which will become the outside of the bag. The nylon tapes used to hang up the bag or suspend it from the user's neck are attached by being sealed under one of the rigid vinyl squares. A flexible vinyl tab, 0.040 in. thick, with half of the snap fastener attached to it, is heat sealed to the rigid vinyl piece on the front of the bag.

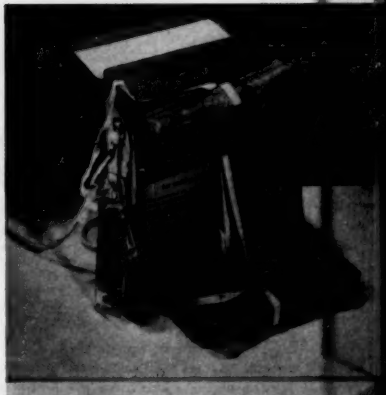
The rigid vinyl pieces and the flexible tab are applied to the sheet simultaneously by electronic heat sealing. Fusing rigid vinyl to elastomeric vinyl is difficult because the rigid vinyl flows at lower temperatures than the elastomeric material. Thus Viplax had to devise a special set-up for this operation. The tabs are held to the sheet in silicone fiber glass jigs which also act as molds and confine the flow of the rigid vinyl to a specified area.

After the tabs have been applied, the side seam of the bag is sealed in an operation which takes only 2 seconds. The end strips at the mouth



Filter base in bottom of bag is injection molded of rigid vinyl material

Vinyl pieces at mouth of bag and tabs for strap fastener are heat sealed on



Desalting kit holds one vinyl bag and seven briquets of special ion exchanger

Each briquet is the size of a candy bar and will desalt 18 oz. of sea water

of the bag are then applied. A strip of rigid vinyl 0.030 in. thick and two strips of elastomeric vinyl 0.020 in. thick are attached to one side of the bag, and a single elastomeric strip is fused to the other side of the mouth of the bag.

All the end strips are attached in a single operation. A cellophane slip sheet is used to keep the opening of the bag from being sealed. The sealing of the strips takes 15 sec., 10 of which are used for cooling under pressure to avoid distortion. Instructions for the use of the kit are printed on the bag so that they cannot be lost.

The filter base which goes into the bottom of the bag is injection molded of rigid vinyl by Plastic Molding Corp., Sandy Hook, Conn. A special filter cloth is used to cover the filter base. A punched polyethylene piece is hot pressed into the cloth to prevent the bag from sticking to the filter and inhibiting the passage of water to the filter.

The stainless steel valve which goes into the filter base is coated with cement and inserted into the heated base. When the base cools, the hole shrinks and firmly holds the valve in place.

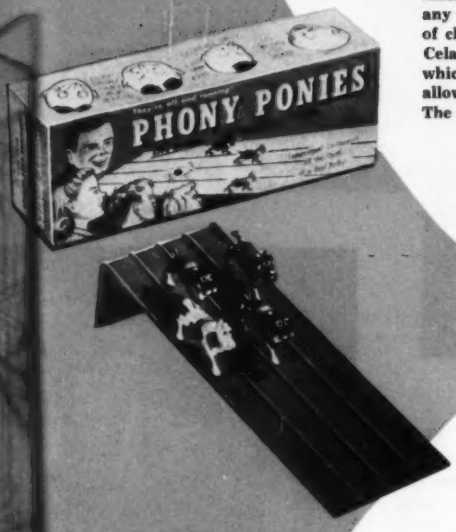
The last step in the manufacture of the bag is placing the filter in it and sealing it with cyclohexanone. The bags are heated to help the solvent evaporate.

Advantages

Because of the shape of the filter base and the method of forming the bags, the finished products are flat and can be rolled up into much smaller space than the cylindrical bags in use in World War II. A further space saving is effected by the use of the small stainless steel valve instead of the long vinyl tube used on the World War II models.

As a result of this space saving, an extra briquet can be packed in each kit, thus increasing the amount of water which can be desalted.

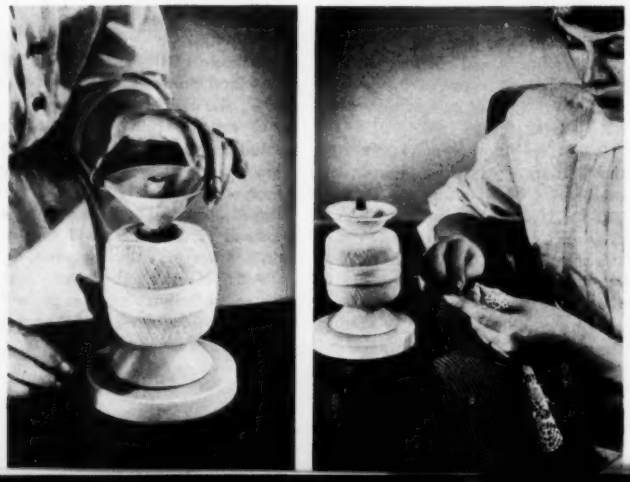
Automatic tax computer gives the correct payroll deductions for any paycheck at a glance and eliminates the need for a clutter of charts on the clerk's desk. The tax tables are printed on a Celanese acetate cylinder. A finger-tip touch rotates the cylinder, which is encased in a printed acetate cover with a window that allows only one line of figures to be seen at a time. Made by The James Co., 1006 Wilmington Blvd., Wilmington, Calif.



Plastics

Toy race horses use Mexican jumping beans as a source of motive power. The 1¾-in. long horses are molded of cellulose acetate. Beans held under their bellies by rubber bands make them jump enough so that they slide down acetate inclined track. Phony Ponies set consists of four horses, one 7-in. long track, and five jumping beans. Made by Precision Specialties, Inc., 212 N. Western Ave., Los Angeles 4, Calif.

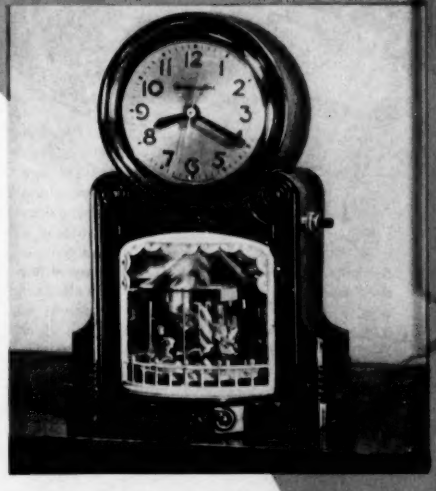
Holder for knitting yarns or thread, molded of Bakelite styrene, automatically adjusts to the size of the spool. It consists of an upright spindle mounted on a conical base and an inverted cone which fits over the spindle to hold the thread or yarn in place. The yarn or thread cannot roll out of reach and cannot knot or tangle. The holder is made by Spin-All Mfg. Co., 1316 National Ave., Rockford, Ill.



Jumping frog, called Frisky Freddy, is molded of styrene. When rubber bulb is squeezed, air is forced through a vinyl tube and into a cylinder which actuates a piston and makes the toy jump realistically. Wide feet give the toy stability. The 4-in. high frog is dark green and has a white shirt front and bow tie. It is made by Weaver Sales Co. P.O. Box 2441, Salt Lake City, Utah

Anchors for holding screws or nails in solid materials such as plaster, brick, or cinder blocks are extruded of Tenite II cellulose acetate butyrate. The star-shaped Sure-Tite anchors cold-flow into the crevices of the hole when a nail or screw is forced in. They are available in ten diameters with three different lengths in each size. Made by Mastercraft Plastics Co., Inc., 86-32 150th St., Jamaica 4, N. Y.

Products

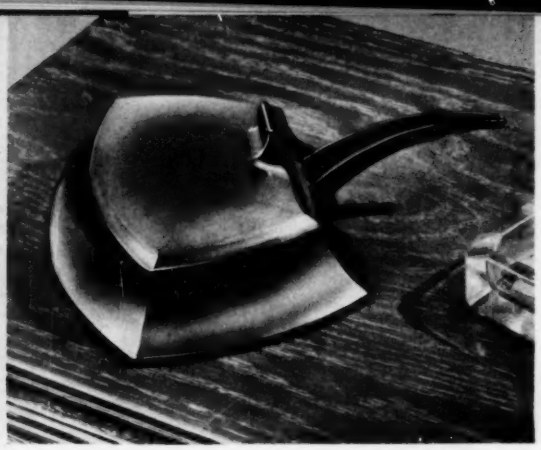


Compact, light weight exposure meter, designed specifically for use with color film, reads directly in camera settings and eliminates necessity for computations. The case of the meter is molded of high-impact cotton flock-filled phenolic. The meter is only $1\frac{11}{16}$ by $2\frac{3}{8}$ by $1\frac{5}{16}$ inches. Made by the Meter and Instrument Dept., General Electric Co., Lynn, Mass.

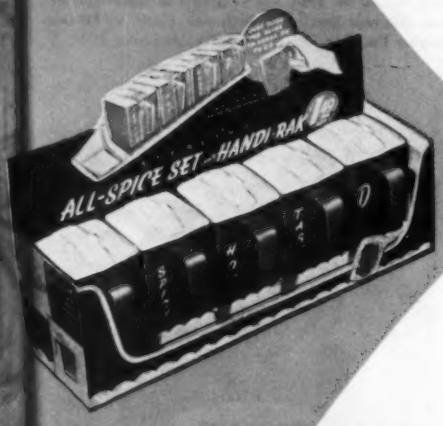
Electric clock with merry-go-round in its base has case molded of cellulose acetate. Merry-go-round revolves continually while the clock is running, and a mirror behind the turntable gives the appearance of depth. Merry-go-round compartment also has a light which can be switched on so clock can be used as a night light. The $10\frac{1}{2}$-in.-high clock is made by Mastercrafters Clock & Radio Co., 216 N. Clinton, Chicago, Ill.

Plastics

Toy housemaid molded of polystyrene will push a broom, mop, or carpet sweeper around the floor. The 6¼-in.-tall toy, powered by a spring motor, glides around in figure 8's. The motor will stop if the toy is lifted off the floor. Made by Irwin Corp., 200 Fifth Ave., New York, N. Y.

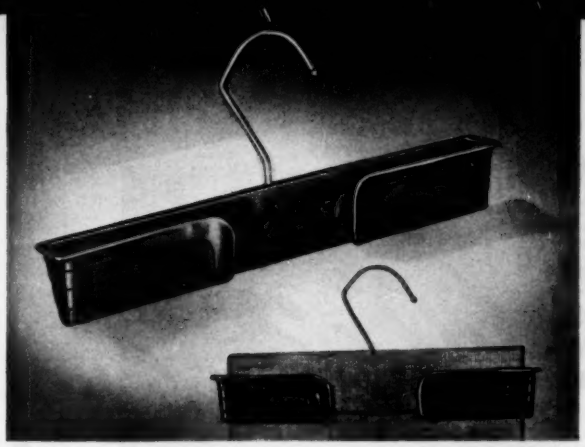


Silent butler is molded of metallic colored styrene and has a metal tray inside to keep cigarette butts from scorching the plastic. The unit is 8 by 6 in. and has a felt base so that it can be used on polished surfaces without danger of scratching. Lid is held tightly closed by spring hinges. Made by Mutual Plastic Mold Co., 4719 Firestone Blvd., South Gate, Calif.



Spice containers molded of styrene come with a shelf which can easily be mounted on wall. Each 4-oz. container has a handle and a snap-fit lid which can be removed. Each lid has a slide which can be moved to dispense the contents through one large hole or series of small holes. Molded to match canisters, also made by Sterling Plastics Co., 1140 Commerce Ave., Union, N. J.

Vinyl raincoat for boys has the contrasting colored collar, cuffs, and pocket welting typical of a cowboy shirt. The coat is smoke gray with yellow trim and includes a Roy Rogers badge. Each snap fastener is adorned with a gold-colored metal gun riveted to a holster-shaped piece of yellow vinyl. All seams in the 4-gage coat are electronically sealed. Made by S. Buchsbaum & Co., 1737 S. Michigan Ave., Chicago 16, Ill.



Hanger made of mahogany colored styrene holds trousers or skirt securely without springs, clamps, or levers. The clothes are simply slipped into the V-shaped slot between the surrounding arms of the hanger. The device, called the Not-A-Mark hanger, holds the clothes without wrinkling or creasing. Made by Not-A-Mark, Inc., 25 Arch St., Boston, Mass.

Pencil designed especially for women is made of Catalin cast phenolic. The pencil is only 3 in. long so that it can fit into even a small handbag. But it is ⅝ in. in diameter, so that it is big enough to be found easily. Ring on the top can be used to hang the pencil to the outside of the handbag. Made in five colors by Brownie Mfg. Co., 55 Frankfort St., New York 38, N. Y.

Products

Completely automatic fire extinguisher consists of glass container of carbon tetrachloride mounted in a wall bracket molded of heat-resistant Beetle urea. When fire raises the temperature to 160° F., a fuse melts, allowing a coil spring to break the glass container. The fluid then emerges as a fog which is drawn to the fire by the draft. Extinguisher is made by Red Comet, Inc., Littletown, Colo.

Lunch kits made of 17-gage calf grain vinyl are lighter than the conventional metal lunch box and will not chip, peel, or rust. The kits are made in three sizes, all with wide top openings which are closed by slide fasteners. Each has a reinforced hard bottom, ventilating holes, a double handle, and welted seams. Made by Natco Products Corp., 484 Dexter St., Providence, R. I.

TO GIVE YOU LARGER PLASTIC MOLDS

up to 60"×28"!

Here is another important addition to Midland's facilities . . . a new Cincinnati Hydro-Tel Milling Machine for plastic mold areas up to 1680 square inches . . . *right in step* with the plastic industry trend to ever larger molded pieces!

This high precision machine permits fast, economical production of molds for the really big plastic parts now being produced and planned for the near future . . . refrigerator door liners, cabinets, sinks and battery cases.

Long famous for hobbed cavities, Midland is ready to meet all of your mold requirements . . . ready to give you fast, dependable service when you specify "Plastic Molds by Midland."

MIDLAND DIE AND ENGRAVING COMPANY

1800 W. Berenice Avenue • Chicago 13, Illinois

Makers of Plastic Molds • Die Cast Molds • Engraved Dies • Steel Stamps • Hobbings • Pantograph Engraving

As a last check on new designs, first samples of raincoats fabricated of vinyl are fitted on live models and carefully studied for measurements, proper fit, and general appearance before dies are finally released for production

Seams Sealed in Seconds

Equipment engineered to mass-produce quality raincoats has enabled one manufacturer to enter successfully a highly competitive market

A RAINCOAT has but one main function—to prevent the wearer from getting wet. However, the material from which a raincoat is made and its method of construction must produce a garment which will not only be rain-proof but will also withstand a great deal of abuse.

Vinyl is tough, but it is tear-conscious on a raw edge, which rules out the production of a strong product if sewing with thread is the fabricating method; tears are readily propagated even from the raw edge of a tiny hole made by a needle. The strongest vinyl products are made by welded seaming, and the best method for producing this type of seam is dielectric heat sealing. In this procedure, high frequency generators furnish power which will almost instantly heat up the contacting surfaces of two or more sheets of vinyl film to the point where a perfect welded bond will exist between them when the seam has cooled.

Since this heat is applied only at the exact location of the bond and by cold dies or electrodes, the time required for the bonded area to cool is negligible—on the order of about 2 sec. for the entire cycle of heating and cooling; in fact, continuous rotary dies produce a bond in a small fraction of a second.

Engineering the equipment and methods for producing a completely heat-sealed garment is far more complicated than setting up the manufacturing methods for making one by machine stitching with thread. Of course, highly skilled operators are required for thread sewing ma-

* Reg. U. S. Pat. Office.

Fig. 1—Knife used for cutting patterns from 350 thicknesses of 0.004-in. vinyl operates at slower speed than the knives used for cutting cloth. Thus it generates less heat and does not cause the cut edges to fuse together

Fig. 2—First heat sealing die used in process of manufacturing raincoats bonds three folded layers of the bodice and the reinforcing strip to each other. It also automatically produces the button-holes by bonding the material at the points which will become the edges of the button-holes. The actual holes between the seals are torn open later

chines, but there is no need for the jigs, fixtures, or other locating devices required for heat sealing; in sewing, the operator manually guides the garment components through the machine so that its straight or curved parts are evenly stitched or hemmed. On the other hand, when the necessary equipment for heat sealing has been designed and installed, unskilled operators can be quickly trained, since it is only necessary to place the garment components in pre-determined locations and press buttons. The machine does the rest automatically.

Engineered Setup

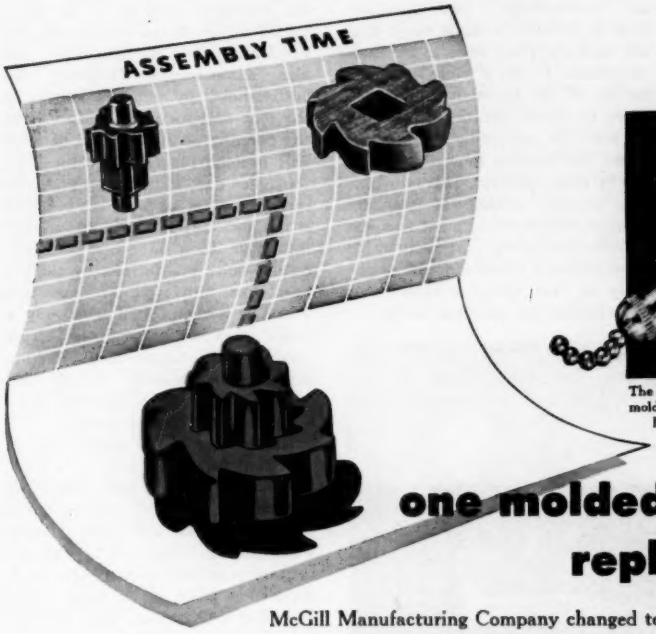
An ideal setup for the high speed and economical manufacture of a complete line of raincoats was engineered by Mayflower Electronic Devices, Inc., West New York, N.J., and manufactured for Plastic Electronic Fabricators, Inc., Union City, N.J. This equipment is now in full-scale production.

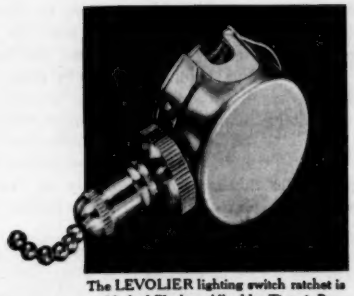
In this new production setup, the first operation is "cutting out the patterns." This procedure is done in a manner similar to that employed in the cloth garment trade. Multiple thicknesses of material—up to 400 layers of vinyl—are laid out on a long table. A paper pattern sheet of the same length and width as the vinyl sheeting is then placed on top of the stacked material. This pattern sheet carries drawn layouts for the various parts of the garment, arranged to minimize waste material.

New Knife Developed

Until recently, the sheet vinyl fabricating industry encountered trouble when cutting many thicknesses of material; the high speed cutting knives—borrowed from the cloth cutting trade—generated so much frictional heat that the edges of the vinyl softened to the point where fusing occurred. As a result, it was necessary to actually tear the sheets apart after cutting. Recently, however, H. Maiman Co., Inc., New York, N.Y., developed a "half-speed" steel knife cutting machine in which the heat generated during cutting is reduced to the point where fusing of the cut edges no longer occurs. Figure 1 shows this knife in use, cutting more than 350 thicknesses of 0.004 in. vinyl.

The different parts required to produce a man's raincoat are: one



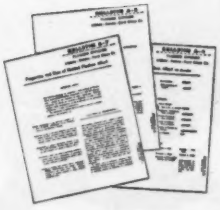


The LEVOLIER lighting switch ratchet is molded of Plaskon Alkyd by Tietz & Baur Plastics, Inc., Melrose Park, Illinois.

one molded piece replaces two!

McGill Manufacturing Company changed to Plaskon Alkyd Molding Compound for contact ratchets in its Levolier Switches — with these surprising results: One molded piece replaced two — no assembly was required! And the exceptional arc-resisting and non-tracking electrical properties of molded Plaskon Alkyd produced a better performing, longer-lasting one-piece ratchet. The most popular type Levolier switch using this ratchet is backed by an unconditional guarantee. It passes Underwriters' tests of a minimum of 24,000 operations carrying maximum electrical load and 100 operations carrying 50% overload!

Many other inherent properties of Plaskon Alkyd are helping to improve a constantly increasing variety of products. And faster production is achieved at lower cost in practically every application—thanks to the high-speed of compression molding with this amazing thermosetting plastic which cures in seconds instead of minutes.



Let us send you data on all of the desirable properties of Plaskon Alkyd — and the complete explanation of why many electrical insulating parts can be compression molded faster at less cost with Plaskon Alkyd.

mold it better and faster with

PLASKON ALKYD

PLASKON DIVISION • LIBBEY • OWENS • FORD GLASS COMPANY
2121 Sylvan Avenue, Toledo 6, Ohio
In Canada: Canadian Industries, Ltd., Montreal, P.Q.
Branch Offices: Boston, Chicago, Los Angeles, New York, Rochester
Manufacturers of Molding Compounds, Resin Glues, Coating Resins

bodice, two raglan sleeves, two pockets, one collar, two under-arm ventilators, two reinforcing strips for the front facing, and one package or carrying case. A woman's coat requires, in addition to these 11 different parts, two belt loops, a belt, and one hood, making a total of 15 different parts for the woman's coat. Both types also include a label, as well as various small disks for reinforcing at strategic points.

Fabricating Setup

First steps in the fabrication of either a man's or a woman's raincoat involve two heat-sealing operations to seal in two reinforcing strips to form the front facings of the coat; that is, the portions of the coat which include the buttons and the button-holes. Two operators pick up a 0.020-in. thick vinyl strip and fold one front edge of the bodice around it with a triple fold. This section of the garment is then located in correct position in the die. To start the automatic cycle of the press, two buttons must be pushed, one by each operator. This two-button control system is standard throughout the entire plant and was installed for safety purposes; by its very nature it eliminates the possibility of one operator closing the press before the second is ready.

Button-Holes Formed

The first heat sealing die, as shown in Fig. 2, is a special development which accomplishes not only the complete bonding of the three folded layers of the bodice and the reinforcing strip to each other, but also automatically produces the button-holes by what is known as the tear-seal method. This involves the bonding of the material at what will become the edges of the button-holes and, at the same time, the compressing of a line of the material at the button-hole location to a very thin wall. In a later operation the button-holes are formed by tearing open this thin wall, an operation which is accomplished with only a small amount of pressure. This method of button-hole making leaves a completely smooth and bonded edge, which is fully reinforced against further tearing.

Reinforcing of the second side of the front facing proceeds in a similar manner, except that instead of producing tear-seal button-holes, location marks are automatically made for the buttons. After the operators complete their work, each section is piled on a large horse equipped with rollers. This material handling setup makes it possible to conveniently transfer the material in process from machine to machine.

Bonding of the left and right under-arm ventilators to the bodice

Fig. 3—Two operators bond the left and right under-arm ventilators to the bodice. Sealing die is roughly triangular in shape

Fig. 4—After sleeve has been bonded to body of coat, sleeve-closing machines are used to bond the raw edges. This is done with sleeve wrong side out; after bonding, sleeve is turned right side out, with raw edges inside

also requires two operators. A heat-sealing die somewhat triangular in shape performs this operation as illustrated in Fig. 3.

Next, two raglan sleeves are bonded to the body of the coat, and the parts are then sent to the two sleeve-closing machines. This operation, illustrated in Fig. 4, bonds the two raw edges of the sleeve. It is performed while the sleeve is inside out, so that when the operation has been completed and the sleeve turned right side out, the raw edges of the material cannot be seen.

Collars Prefabricated

A highly specialized sealing unit is used to produce a three-ply tear-seal collar. Three thicknesses of vinyl which have been cut to correct shape for the collar are laid in position in the lower portion of this special die. The upper portion of the die consists of two bars, one formed to the exact shape and size of the collar and the other an inner bar formed to the same shape but smaller in size. The inner bar is spring-loaded and the outer one fixed rigidly in position. As the die closes on the vinyl material, the action of the spring-loaded portion of the die is to produce a perfect bond about 0.25 in. in from the outside edge of the collar. The fixed portion of the die also produces a bond, but because it is designed to close further than the spring-loaded part, it squeezes or extrudes the material on the outer portion of the bond to a very thin wall. This makes it possible, once the bonded sections of vinyl are removed from the die, for the operator to quickly tear the excess scrap from the outer edge of the piece, leaving a completely finished collar.

The next operation, Fig. 5, consists of heat sealing the pre-cut pockets to the bodice of the coat. Location marks have previously been made on the bodice, so that the operator merely locates the coat by these indicating points. A formed die completes the operation.

The partially finished coat then goes to a straight-bar sealer, which is used to assemble the prefabricated collar in place. Two heat sealing operations are performed on the

(*Continued on p. 104*)

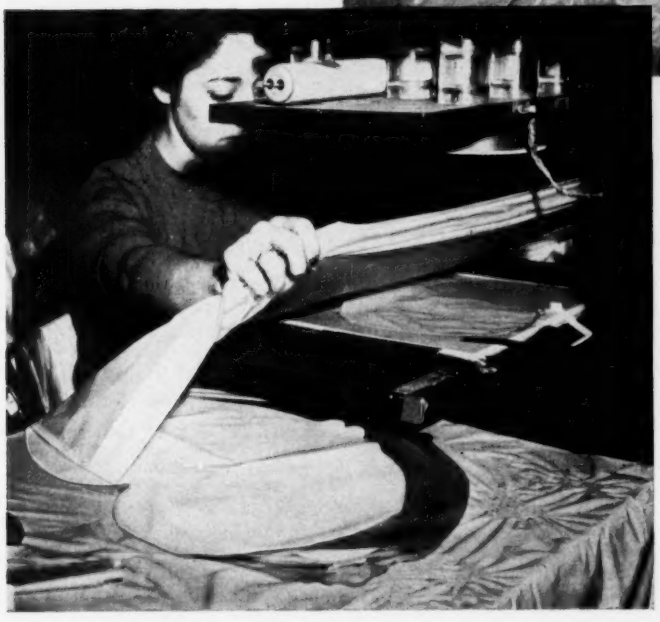


Fig. 6—Straight-bar sealer is used for two operations on collar. Prefabricated collar is first basted on one side, then turned over so that protruding raw edges can be bonded. This double bonding results in a stronger collar assembly, eliminates need for subsequent trimming. Label is sealed-in during operation

Fig. 5—Pre-cut pockets are heat sealed to the bodice of the coat. Location marks previously made on the bodice simplify this sealing step

BOTH TRAYLOADS WEIGH THE SAME! Tray on left holds ordinary dishes; tray on right holds Prolon Ware molded of MELMAC —nearly three times as many dishes!

Breakage cut by 95%... labor costs reduced by 25%

The Director of Duke University's eight dining halls heartily endorses the remarkable break-resistance and light weight of

DINNERWARE MOLDED OF MELMAC®

"Since we switched over to dinnerware made of MELMAC we have been able to cut breakage by about ninety-five per cent . . .

". . . many of our customers compliment us on the quietness of our dining rooms since we installed plastic dinnerware . . .

"We lowered our labor costs about 25% in the bussing of dishes. We were able to switch from boys to girls, and each bus girl can carry *nearly three times more plastic dishes than the ordinary variety.*

". . . We have purchased several different shades which blend together harmoniously."

There you have it. On the basis of durability, reduction of clatter, tremendous savings and good looks, dinnerware molded of MELMAC is piling up a remarkable record wherever it is installed.

It will pay you to investigate! Switch to dinnerware molded of MELMAC—and don't accept inferior substitutes.

Ask your supplier for plastic dinnerware identified by this insignia. It complies with the high standards of quality established for heavy-duty melamine dinnerware by industry through the U. S. Department of Commerce.

AMERICAN *Cyanamid* COMPANY

PLASTICS DEPARTMENT

32 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

In Canada: North American Cyanamid Limited, Royal Bank Building, Toronto, Ontario, Canada

Cyanamid Looks At PLASTICS TODAY...

ABOUT five years ago, the Plastics Industry was threatened by an alarming misuse and misapplication of plastics materials. This situation naturally caused some unfavorable impressions of both plastics and those engaged in their manufacture and use.

In an effort to remedy this situation, leading molders and fabricators, raw materials producers, and the SPI —through advertising, merchandising and publicity— warned the public that "plastic" is not a generic term, and for each application there is a "best suited" material.

This effort from the inside had the desired effect. It eliminated almost all misapplications of plastics, influenced the adoption of performance standards, and won back the respect of consumers by teaching them more about these materials.

For example, consider melamine dinnerware:

Certainly one of the most significant achievements in marketing such dinnerware . . . and one of the most effective reasons for its large fast-growing acceptance . . . was the establishment of the melamine dinnerware "hallmark" to signify compliance with high standards of quality established *by industry* through the U. S. Department of Commerce.

Then, too, an advertising campaign based on authenticated case-histories (like the one on the left), *checked and supplied by molders*, has re-assured prospects in the institutional and commercial restaurant fields. This has certainly helped the development of this market.

Users of melamine dinnerware via informative leaflets and tags (prepared and supplied by Cyanamid, but *distributed by the molders*), have learned how best to care for it and what to expect from it.

This program has been based on the combined and integrated efforts of all concerned—raw materials supplier and molders. Results: good product, good market, good business. How can cooperation pay off any better?

Atomizer cap molded for Elizabeth Arden by Cole's Manufacturing Co., Hartford.
Green watch box molded by Rathbun Molding Corporation, Salamanca, New York.
Your Product

situation's well in hand

with closures and packaging molded of Beetle® plastic

Sales appeal in color . . . beautiful BEETLE colors that go through from surface to surface . . . they won't fade, peel or crack.

BEETLE (urea-formaldehyde molding compound) is durable, too . . . resists scratches and wear . . . won't melt or soften under heat . . . *won't attract dust.* And cleans easily with a whisk of a damp cloth.

All this, plus lightweight, high impact strength, no taste or odor, resistance to alcohol, common solvents and essential oils make BEETLE outstanding for closures and packaging, and *naturally*, appliance housings and handles.

Fit BEETLE into your product. May we help?

We may be able to help you meet military specifications where plastics and resins are concerned. What's your problem?

AMERICAN *Cyanamid* COMPANY

PLASTICS DEPARTMENT

32 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

In Canada: North American Cyanamid Limited, Royal Bank Building, Toronto, Ontario, Canada

Fig. 8—Rotary high-frequency sealer hems the raw edges of the bottom of the coat and the ends of the sleeves. Die is machined so that the finished hem looks as if it had been sewed

Fig. 7—Button-sewing machines put on either 2-hole or 4-hole buttons automatically. Cycle includes a predetermined number of needle strokes and the final tying of knot in thread

collar in the same die. It is first "basted" on one side (Fig. 6); then the collar is turned over and a second bonding operation seals the protruding raw edge of the collar, so that no subsequent trimming operation is required. This double bonding operation also produces a much stronger collar assembly. The label is heat-sealed in during this same operation.

The in-process material is next taken to the button-sewing machines (Fig. 7), which were specially designed by Singer to sew automatically either 2-hole or 4-hole buttons. The complete sewing cycle is automatic and includes a predetermined number of needle strokes as well as the final tying of a knot in the thread. The operator simply places the buttons in their correct positions on the machine and starts the cycle. In order to produce as strong a job as possible, Plastic Electronic Fabricators employ a 16-ligne phenolic stay-button on the inside of the facing to reinforce the 30-ligne button on the outside. Both of these buttons are sewn automatically at the same time.

Hemming

Hemming the raw edges of the bottom of the coat and the ends of the sleeves is accomplished (Fig. 8) on a rotary high-frequency sealer with the die machined so that it produces a hem which looks as though it were sewed. The material is started by hand through a device known as a 3/16-in. triple-hemmer which automatically produces three folds before the material reaches the rotary sealer. Once the sealing operation starts, the material is pulled through the triple-hemmer by the action of the rotating die.

The belts for the ladies' garments require only hemming after they have been cut to their proper shape. Figure 9 illustrates this hemming operation in action. The belt loops on the ladies' coats are heat-sealed in place.

One stage of the manufacture of the vinyl hoods or rain-hats which are included with each lady's raincoat is shown in Fig. 10. A similar type of operation is used to produce the carrying case.

After final inspection, the coats are stacked on a large table (Fig. 11), where operators skilled in the handling of vinyl material smooth them out and fold them into a compact bundle.

Emphasis on Quality

Although the setup at this modern raincoat manufacturer's plant has been designed for maximum speed and efficiency so that his garments can be sold in competition with practically any other manufacturer's, he has not permitted any short cuts or skimping of materials to lower the high quality of his product. This can best be attested by the fact that his plant is now operating on two shifts and still is having difficulty keeping up with the steady flow of orders constantly coming in from the field.

There are approximately 15 dif-

ferent shades of vinyl in which the coats are now being manufactured, and there are two embossed patterns —taffeta and moire—that are available to customers.

The work in this plant to date has produced some interesting comparisons on the heat sealability of the various materials used. The manufacturer's experience indicates that red material is at the low end of the scale, as far as sealability is concerned, with black being somewhat better, and green being fairly easy to seal. The best results, however, are obtained with films which are produced with no colorants; and it is interesting to note that the plain films seal better than those which have been embossed.

Fig. 9—Belts for ladies' coats are hemmed after they have been cut to their proper shape. Belt loops on the ladies' coats are heat-sealed in place

Fig. 10—Vinyl hoods or rain-hats which go with ladies' raincoats are made by heat sealing. Coat carrying case is produced by similar operation

Fig. 11—After final inspection, operators skilled in handling of vinyl material smooth coats and fold them into compact bundles

Large Laminate Cylinders

by C. W. WILSON*

LARGER and larger insulating cylinders for use in power transformers have been in constant demand by the electrical industry as engineers have endeavored to produce larger and larger units. Not only have the engineers been increasing the KVA ratings of these power giants, but they have at the same time been elevating the operating voltages, all of which means larger physical sizes.

Thus, while the larger convolute wound insulating cylinders, unique in the design of General Electric[1] power transformers, have been demanded by the increased KVA rating, increases in operating voltages have at the same time necessitated improvements in the electrical properties of the construction materials. When it is realized that the price tag on some of the large power transformers may be in excess of $250,000, it is obvious that radical design and the use of new materials can be incorporated only after extensive and costly surveys.

* Transformer and Allied Products Laboratory, General Electric Co., Pittsfield, Mass.
[1] Apparatus Dept., General Electric Co., Pittsfield, Mass.

Where Used

In brief, a power transformer of the type being considered (Fig. 1) is composed of a laminated steel core with primary and secondary windings. In General Electric transformers, the design permits the use of very simple cylindrical insulating structures between the core and the low voltage winding and between the low voltage and the high voltage windings. The complete unit is immersed in a liquid cooling medium which determines, to a large extent, the organic materials which are used in the construction of the insulating cylinders.

Two kinds of convolute wound cylinders are required in large transformers. One is a hard, dense cylinder laminated from paper and a phenolic type resin; the other is made of paper and an adhesive.

The insulating cylinder over the

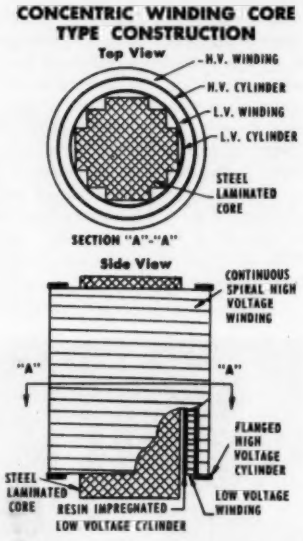
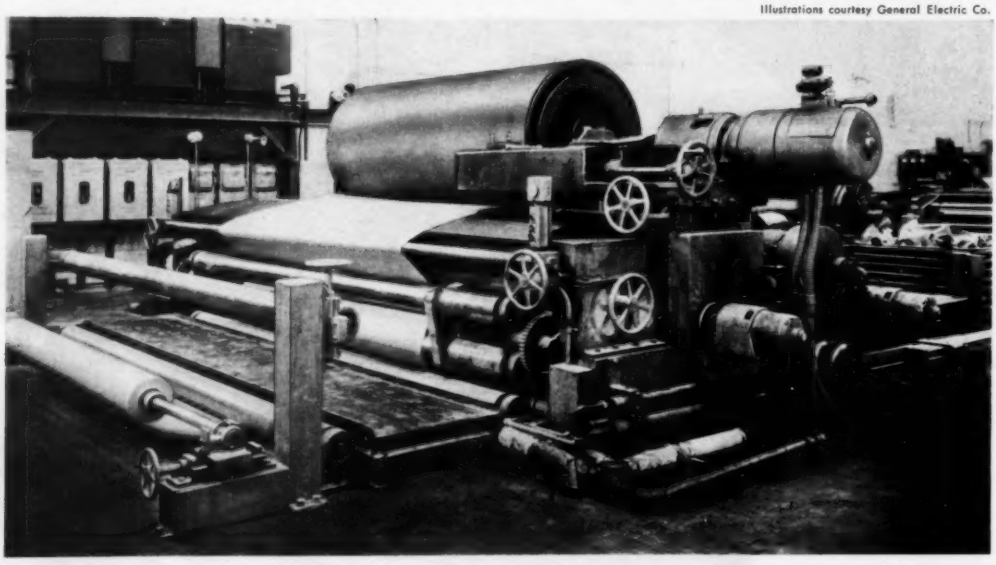


Fig. 1—Drawing shows the location of laminate cylinders in transformer

Fig. 2—Cylinder rolling machine was designed to take mandrils as large as 90 in. in diameter and as long as 150 inches. The mandril shown in place in the photograph below will roll a cylinder 42½ in. i.d. and with a length of 99½ inches

Illustrations courtesy General Electric Co.



steel core and on which the low voltage windings are spirally wound, is always of the resin impregnated type. This is because of the high mechanical strength required by the cylinder to resist the forces, set up in the event of a short circuit, which tend to compress the low voltage winding.

The insulating cylinder between the low voltage and high voltage windings is of the paper-adhesive type. This tube is made from a heavy water-finish Kraft paper, and is bonded with dextrin or an organic resin adhesive. It is produced with unbonded ends to permit the formation of flanges after the high voltage windings are applied to the tube. This feature is necessary since the extremes of the high voltage windings produce an area of higher voltage stress than throughout the central portions of the tube.

When dextrin is used as the adhesive, the cylinder must be dried for a considerable length of time because of the large amount of water which is wound into the heavy wall structure. The adhesive bonded tube is satisfactory for the high voltage windings, since they are not subject to high mechanical stresses at any time; further, since during operation the tube is completely saturated with oil, its electrical properties are equivalent to those found in the phenolic-impregnated cylinder.

90 In. in Diameter

The largest G. E. transformer produced to date required a cylinder 76 in. in diameter with approximate wall thickness of 1½ inches. When the winding equipment was produced, however, it was designed so that cylinders up to 90 in. in diameter and 150 in. long could be rolled if required. Figure 2 shows the large rolling machine with a mandril which will produce a 42½ in. i.d. cylinder, 99½ in. long. The mandril rides on two saddle rolls, and the shaft mountings or bearings of the mandril are equipped with cylinders which may be actuated either hydraulically or pneumatically to pull the mandril down against the saddle rolls with a constant pressure, generally in the neighborhood of 100 lb. per linear inch of tube. Because of the floating action of the mandril, the pressure on the tube remains constant as the tube thicknesses build up during the rolling process.

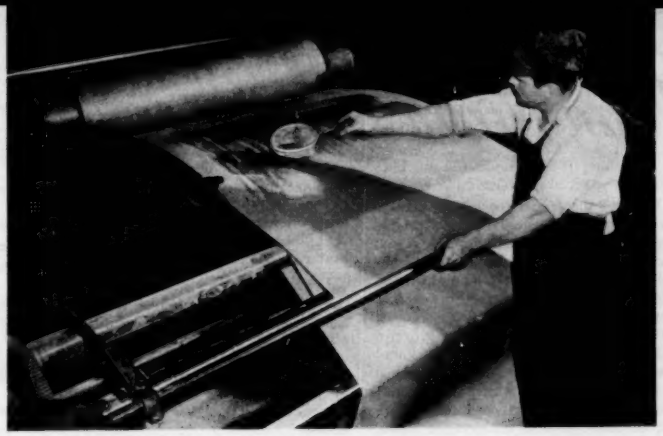


Fig. 3—Sprinkling dry resin on the web of paper as it approaches the mandril. Hot plate under web furnishes heat to melt resin, which forms pool in front of mandril

Before starting the rolling operation, the mandril is preheated to approximately 200° F. Additional heat is applied to the saddle rolls during the rolling operation, which in turn acts to keep the mandril up to the correct temperature. Because very accurate temperature control is required, temperature of the saddle rolls is maintained by thermostatically controlled circulating oil.

The rolling process is a one-step operation, and is termed the "dry process," as opposed to the solvent varnish system which requires pre-impregnation and drying of the paper web. As the paper approaches the mandril, it passes over a hot plate, at which point finely ground, dry resin is sprinkled onto the web. (See Fig. 3.) The heat from the hot plate melts this dry resin, which collects into a pool formed in front of the mandril and above one of the saddle rolls.

In order to hold the resin content to its required approximate 45% by weight, it is necessary that the flow point, penetration, melt viscosity, and gel time be carefully controlled. In addition, the resin pickup is also controlled by the porosity, thickness, density, and chemical purity of the paper web.

Curing the Tube

After the tube has been built up to the thickness required, the mandril, with its wound tube, is removed to a high velocity hot air oven where the final and complete cure takes place. The mandril and tube are then cooled, and the two are placed in a hydraulic tube stripper. This machine consists of a stripping ring which encircles the o.d. of the mandril closely and presses against one end of the tube. The stripping ring is held in a fixed position and a hydraulically-actuated piston pushes the mandril out of the tube.

For tubes up to 18 in. in diameter, the outside surface is finished by centerless grinding; larger size tubes are sanded. A sawing operation is used to trim the two ends to bring the tube to the required length.

General Electric claims the following advantages for this dry process: 1) it is a one-step operation; 2) no solvent is required, since the web is not pre-coated; 3) the large equipment investment required for pre-impregnating wide sheets of paper is eliminated; 4) because there is little if any volatile content, there are fewer delaminations in the wound tube; and 5) superior electrical properties result, because of the complete absence of any residual solvent.

This giant size tube-rolling equipment is not limited to the phenolic-paper tubes for transformer applications. Large cylinders for bearings, betatrons, and certain other structural applications can be made. The web may be asbestos, cloth, paper, or glass fiber. The resins employed to date cover about all known thermosetting laminating resins, including the silicones. One specialty application required the production of a large-diameter Fiberglas cloth-polyester cylinder with a 4-in. wall thickness.

When Needed . . . a specialist

There are vast treasures under the sea. They yield their secret to specialists only.

Without the proper specialists, many a fine product, too, would not give up the treasure buried in it. That's why you'll find one of America's most brilliant group of specialists in plastics at Marblette. And, around these men, Marblette has built up over 22 years the *special* equipment specialists must have. Only thus has it become possible to give you the special formulation in each liquid phenolic resin necessary to meet your special production requirements . . . and to meet also the special functional needs of your production and your special marketing problems.

Marblette's liquid phenolic resins are the thermosetting plastics which can be set either by heat or at room temperature. Among other properties, they are weather-proof, solvent-proof, fungi-proof; resistant to abrasion, heat and temperature.

Let Marblette's 22 years' experience help you in solving your liquid phenolic resin needs—in drum or tank car quantities. Our plant and offices are strategically located to serve you promptly anywhere in the United States. Write "Marblette Engineering" to analyze and prepare samples for you of the one phenolic resin best suited to your special needs.

liquid phenolic resins

Casting resins for dies and tools
Heat and acid resistant resins • Bonding resins
Resin foundry core binders • Bristle setting cement
Laminating varnish • Wood coating • Plastic cements
Metal coating • Insulating varnish • Sealing resins

MARBLETTE

37-21 30th St., Long Island City, N. Y. • ST 4-8100
CHICAGO • LOS ANGELES • TORONTO • HAVANA

Sodium Cellulose Sulfate

by GEORGE P. TOUEY†

Sodium cellulose sulfate, the sodium salt of cellulose acid sulfate, is a non-toxic powder with a sulfur content of 5 to 7%, insoluble in organic solvents, but soluble in hot or cold water. Its solutions are neutral and highly viscous at low concentrations. These solutions tolerate relatively large amounts of acids, bases, salts, and water-miscible organic solvents. They are compatible with solutions of other water-soluble polymers, sugars, and many surface-active agents. Films prepared from these solutions are colorless, transparent, strong, flexible, and oil-resistant. Laboratory tests indicate that this ester salt has a variety of applications based on its suspending, thickening, stabilizing, and film-forming properties.

DURING the past 20 years a new class of cellulose derivatives has been steadily growing into commercial importance. This class consists of those derivatives of cellulose that dissolve in water to give highly viscous solutions under conditions of low concentration.

The first of the water-soluble cellulose derivatives to be developed commercially was the methyl ether of cellulose (11)[1]. This product, called methyl cellulose, is insoluble in hot water, but soluble in cold water. Its solutions have found commercial applications as thickening, emulsion-stabilizing, and film-forming agents.

The realization of the industrial value of methyl cellulose led to the development of other water-soluble derivatives of cellulose, and soon the hydroxyalkyl ethers and the carboxyalkyl ethers of cellulose were introduced (8, 5). These compounds have properties similar to those of methyl cellulose but they have the added advantage of being soluble in either hot or cold water.

The physical and chemical properties and some potential industrial applications of another hot- and cold-water-soluble derivative of cellulose are described in this article. This derivative is the sodium salt of cellulose acid sulfate having a sulfur content of 5 to 7 percent. The product is called sodium cellulose sulfate, or SCS. Most of the information presented is based on laboratory investigations of this material, which is being produced in experimental quantities.

Preparation

Cellulose can react with sulfuric acid according to equation 1, in which only one anhydroglucose unit of the polymer is represented:

$$C_6H_9O_4\cdot OH + HOSO_2OH \rightarrow C_6H_9O_4OSO_2OH + H_2O \quad [1]$$

When more than one hydroxyl group in the glucose unit is substituted, di- and trisulfates are produced:

$$C_6H_8O_3(OSO_2OH)_2 \text{ and } C_6H_7O_2(OSO_2OH)_3.$$

Only one hydrogen atom of the sulfuric acid molecule is involved in the reaction to form the acid ester; the second hydrogen atom remains free to form a salt, as indicated in equation 2:

$$C_6H_9O_4OSO_2OH \text{ (cellulose acid sulfate)} + NaOH \rightarrow C_6H_9O_4OSO_2ONa \text{ (sodium cellulose sulfate)} + H_2O \quad [2]$$

From the commercial viewpoint, cellulose sulfate is a new product; however, it has been known in the laboratory for many years. In 1894, Stern prepared cellulose disulfate by dissolving cellulose in sulfuric acid at low temperatures (10). In 1928, Traube, Blaser, and Grunert prepared cellulose trisulfate from dried cellulose and sulfur trioxide (12). Also in 1928, Fulnegg, Stevens, and Dingler prepared cellulose di- and trisulfates by allowing cellulose to react with chlorosulfonic acid in the presence of excess pyridine (6); this reaction is shown in equation 3.

$$C_6H_9O_4\cdot OH + ClSO_2OH \rightarrow C_6H_9O_4\cdot OSO_2OH + HCl \quad [3]$$

By this method, pyridinium salts of cellulose sulfate are formed, and the liberated hydrochloric acid is neutralized by the excess pyridine.

Recently, a new process of sulfating cellulose in such a manner that a substantially undegraded product is obtained has been developed by Tennessee Eastman Co. This product and its sodium salt are soluble in water, and have esterification values equivalent to one sulfate group per three anhydroglucose units. The structure is shown in Fig. 1.

Physical Properties

Dry Powder—SCS is an odorless, non-flammable, pale yellow, free-flowing powder. It has a bulk den-

* Reg. U.S. Pat. Office
† Research Laboratories, Tennessee Eastman Co.
[1] Numbers in parentheses link to references on p. 183.

sity of 30 to 45 lb. per cu. ft., and a moisture content (as shipped) of 3 to 5 percent. The powder is insoluble in the common organic solvents, but is soluble in either hot or cold water. Although the product can be classified as a hydrophilic colloid, it is not hygroscopic; hence, it will not form lumps under normal storage conditions, and can be contained in paper bags or fiber drums.

Solutions—SCS is produced at the present time in two viscosity types —medium and low. The viscosity range of the former is 300 to 1000 cp., and that of the latter is 20 to 70 cp.; both values are for 2% solutions at 25°C. Clear, viscous aqueous solutions can be prepared from either viscosity type by slowly adding the dry powder to water with vigorous agitation.

The viscosity of a solution of SCS increases rapidly with small increases in the concentration (Fig. 2) until finally the viscous solution becomes a gel. The viscosity decreases as the temperature rises (Fig. 3).

All viscosity data presented in Fig. 2 and 3 were obtained in the following manner: The moisture content of a sample of SCS was determined by drying a portion of it at 105° C. Another portion of the sample was then weighed into a glass-stoppered, 16-oz. bottle, and the calculated amount of distilled water, based on the dry weight of the product, was added. The bottle was placed in a drum tumbler and tumbled at 5 r.p.m. until solution was complete. After adjusting the temperature of the solution to 25°±0.1° C., its viscosity was measured by means of a Brookfield Viscometer, employing Model LVF.

The decrease in the viscosity of an SCS solution with rise in temperature is not permanent; hence, when a heated solution is cooled, its viscosity returns to its original value. However, prolonged refluxing does result in a permanent lowering of the viscosity; for example, an 8-hr. reflux reduces the viscosity by approximately 50 percent.

Solutions of SCS are compatible in varying degrees with water-miscible organic solvents, such as acetone, monohydric alcohols, glycols, and organic acids. Solutions of the low-viscosity type of product have a higher tolerance for such solvents than solutions of the medium-viscosity type. A 6% solution of the low-viscosity type or a 3% solution of the medium-viscosity type will tolerate 25% by volume of acetone or ethyl alcohol without gelling or showing signs of precipitation. No incompatibility is observed when glycerol, ethylene glycol, diethylene glycol, propylene glycol, pyridine, or the ethanolamines are mixed in equal volumes with solutions of either viscosity type.

Solutions of SCS are compatible in all proportions with solutions of other water-soluble cellulose derivatives, such as methyl cellulose, sodium carboxymethyl cellulose, and hydroxyethyl cellulose. They are also compatible with solutions of the water-soluble natural gums, gelatin, sodium alginate, dextrins, sugars, starches, polyvinyl alcohol, soaps, and most surface-active agents.

On prolonged storage, solutions of SCS may be attacked by mold growth unless they are protected by a small amount of a preservative, such as sodium benzoate or phenol. The choice of preservative is dependent upon the use involved.

Films—Water-soluble films of SCS can be prepared from a solution of the product by spreading the solution onto a smooth, flat surface, such as glass or polished metal, and allowing the water to evaporate at room temperatures. Although either viscosity type of the ester salt can be employed for making films, it is usually better to use the low-viscosity type because it is capable of giving more highly concentrated solutions.

Usually a plasticizer is required in these films so that they can be readily removed from the coating surface, and can be creased without cracking. Polyhydric alcohols, such as glycerol, ethylene glycol, propylene glycol, and sorbitol, have been found to be excellent plasticizers when used in amounts up to 15%, based on the weight of the cellulose derivative.

Films of SCS are insoluble in organic solvents and are non-flammable, transparent, colorless, and flexible. They are remarkably stable to ultra-violet light, and are highly resistant to the penetration of oils and greases. They are also quite strong, having a tensile strength of approximately 10,000 p.s.i.

Chemical Properties

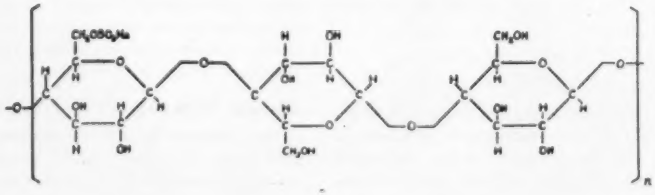
Stability—SCS is quite stable thermally. The material is not charred and its viscosity is not affected when it is stored in an oven at 100° C. for 24 hours. It also withstands temperatures as high as 160° C. for several hours without discoloration. Solutions of the material withstand refluxing for moderate periods of time, and their viscosities are not affected by storage at room temperature.

Although the sulfate groups in SCS are attached to the cellulose by ester-type linkages, they are quite resistant to hydrolysis by acids and bases. Dilute sodium hydroxide removes very little sulfuric acid, and only on boiling with dilute hydrochloric acid can sulfuric acid be recovered quantitatively.

Compatibility With Acids and Bases—The low-viscosity type of SCS is superior, and the medium-viscosity type is at least equal to other water-soluble cellulose derivatives in resistance to precipitation by acids. Mineral acids cause precipitation of the medium-viscosity type, whereas organic acids, such as formic or acetic, do not.

The addition of a solution of a strong alkali to a solution of SCS causes no precipitation or gelation, but has an immediate and permanent effect on its viscosity. At or above a pH of 11 the viscosity is decreased to about one-third of its original value, and there is gradual further lowering of the viscosity when the solution is stored for sev-

Fig. 1—Structure of substantially undegraded sodium cellulose sulfate by new process



MOSINEE

"More than Paper"

If you have a problem involving paper . . .
if you require specific technical characteristics, and,
above all, *dependable uniformity,* it may pay you
well to get in touch with MOSINEE.

MOSINEE is not interested so much in terms of
volume production as in the ability of our technicians
to render helpful service to our customers in the
plastics and other industries. Our "paperologists" are at
your service for consultation.

MOSINEE PAPER MILLS COMPANY MOSINEE, WIS.

"Essential Paper Manufacturers"

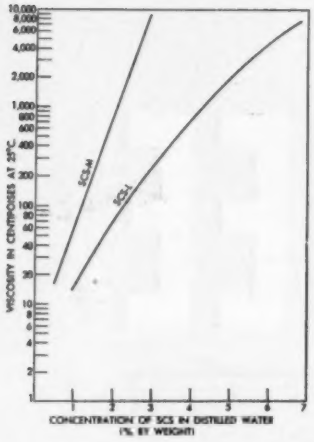


Fig. 2—Effect of concentration on the viscosity of a pair of SCS solutions

eral days. This phenomenon, however, is not due to any removal of sulfate groups by the alkali.

Compatibility With Metallic Salts—The tolerance of solutions of medium-viscosity SCS to metallic salts is good, and that of the low-viscosity type is excellent. For example, the latter is not precipitated by solutions containing up to 5% of calcium, nickel, copper, iron (ferrous and ferric), or aluminum salts. The salt concentration causing precipitation or gelation of a solution of either viscosity type varies with the salt, but it is always lower for the medium-viscosity type than for the low-viscosity type.

Ionic Nature—SCS is a salt with a pH of 6.0 to 7.5. Under the proper conditions, it is possible to prepare water-insoluble salts from the sodium salt by double decomposition. This reaction is illustrated by the preparation of the zirconium salt. Thus, when a solution of SCS is mixed with a solution of a zirconium salt, a heavy precipitate of zirconium cellulose sulfate is formed in the mixture immediately.

In addition to the sodium salt, there are several other water-soluble salts of cellulose acid sulfate. These include the salts of calcium, magnesium, zinc, nickel, ammonia, and several amines. These salts were made in the laboratory from the low-viscosity types of cellulose acid sulfate.

Toxicity—Although animal feeding experiments are still in progress, preliminary reports from this study indicate that SCS is non-toxic. When rats were fed a diet containing 20% by weight of the ester salt, they experienced no adverse effects other than the retarded growth which might be expected from a diet containing 20% of inert material. SCS has exhibited no harmful effect on the skin, either dry or in solution.

Insolubilization—Free hydroxyl groups in SCS permit limitation of its water solubility by several methods. A convenient method of insolubilization is the condensation of the product with one of the common aldehyde-type cross-linking agents, such as glyoxal, a urea-formaldehyde resin, or a melamine-formaldehyde resin. For example, a dope capable of forming water-resistant films was prepared by dissolving 6 parts of low-viscosity type SCS and 3 parts of glyoxal (10 parts of a 30% solution) in 95 parts of water.

In preparing water-resistant films by means of the urea-formaldehyde and melamine-formaldehyde resins, an acid salt is used as a catalyst, and the products are given a heat-curing treatment to complete the reaction (1).

Uses

SCS possesses suspending, thickening, stabilizing, and film-forming properties similar to those of other water-soluble cellulose derivatives, gelatin, sodium alginate, and the water-soluble natural gums. This new cellulose derivative has been shown to be useful in a wide variety of applications.

Detergent Additive—Detergent action in the laundering of fabrics is the sum of two factors: the removal of soil from the fabric, and its suspension in the detergent solution in such a manner that it cannot redeposit on the fabric. Although synthetic detergents are capable of removing soil from a fabric, they lack the ability to prevent its redeposition. Therefore, any additive which would improve the suspending power of a detergent would thereby improve its cleansing power; such a material would be especially valuable in the laundering of cotton. In the case of soaps this inability to prevent soil redeposition also exists, but to a lesser extent; hence, with soaps the improvement due to the additive is not as pronounced as with detergents.

A number of products have been proposed as materials for improving the soil-suspending properties of a detergent solution. The most recent of these has been the cellulose ether salt, sodium carboxymethyl cellulose (2, 13, 14). At the present time, this water-soluble cellulose derivative is used commercially in several detergent formulations.

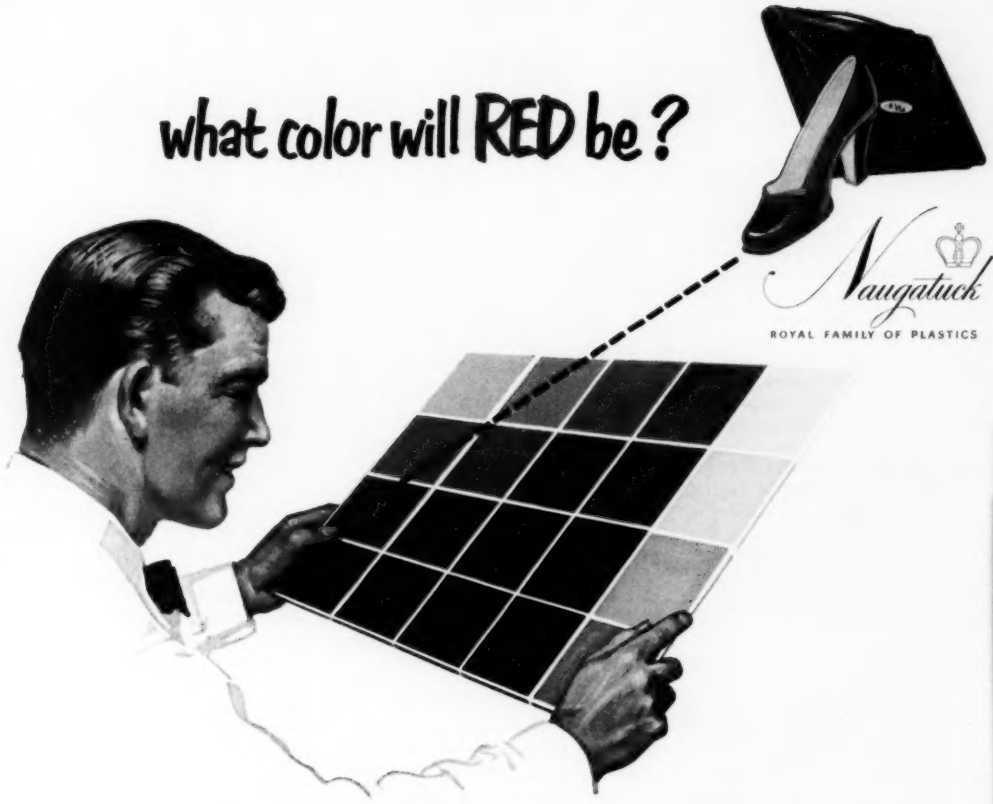
SCS also functions well as an additive for the common synthetic detergents. Good soil-suspending action was obtained when the material was present in a detergent mixture in amounts as low as 5%, based on the weight of the detergent. The medium- and low-viscosity types were found to be equally effective in this capacity.

Oil Well Drilling Mud Additive—Mud is an important item in the drilling of oil wells, and a product that can maintain the proper balance between the water and the suspended solids in the mud is a valuable aid to the oil well driller. SCS should be a useful product in this capacity because it is an excellent suspending and viscosity-modifying agent. In addition, it is not readily precipitated from solutions by metallic salts or heat; it is thermally stable; and its fine, granular form facilitates handling and its dispersion in water.

Thickening and Suspending Agent—Most of the properties desirable in a thickening and suspending agent for aqueous systems have already been shown to be possessed by SCS. It is soluble in either hot or cold water, and forms viscous solutions at low concentrations. These solutions are miscible to a limited extent with water-soluble organic solvents, and they are compatible with a wide variety of other materials of a water-soluble nature.

The thickening and suspending properties of SCS may be utilized in the preparation of paints which contain water as the vehicle. Water paints were produced by simply mixing a solution of the low-viscosity type of product with finely powdered pigments, such as cadmium red, titanium oxide, and zinc oxide. An alkyd-resin emulsion paint was produced by emulsifying the alkyd resin with a solution of SCS and an emulsifying agent, then adding a

what color will RED be?



Naugatuck

ROYAL FAMILY OF PLASTICS

How Naugatuck Marvinol Laboratories can help you with color problems in VINYLS

In compounding or processing do you maintain your vinyl colors just as you want them? Do color-matched products really match? Do they remain true as long as the product lives?

These are tough problems. But the Naugatuck Chemical Laboratories may have answers to help you solve many of them.

Thousands of man-hours and dollars are devoted each year to fundamental color technology. The results of this unusual storehouse of color "know-how" are here for application to your problems.

Hundreds of charts record the effect of stabilizers and lubricants on the heat and light stability of the important colorants in vinyl compounds. Competent color technologists are ready to advise and help you.

Our Naugatuck laboratory is *your* laboratory with vast amounts of data on colorants, stabilizers, plasticizers, and plastic processing techniques. And our Naugatuck Marvinol resins have the *stability* your products need.

Yes, Naugatuck is a sound base for your plastics future—with the right combination of laboratory "know-how" plus the best resins or resin combinations for your future. Why not see how much our scientific service and our Marvinol resins can do for your products? Write us today on your company letterhead. Send inquiry to the address below.

Naugatuck Chemical Division of UNITED STATES RUBBER COMPANY

209 ELM ST., NAUGATUCK, CONNECTICUT

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • New York • Philadelphia • IN CANADA: Naugatuck Chemicals, Elmira, Ontario

MARVINOL® vinyl resins • KRALASTIC® styrene copolymers • VIBRIN® polyester resins

Rubber Chemicals
Aromatics
Synthetic Rubber
Agricultural Chemicals
Reclaimed Rubber
Latices

pigment. A latex paint was prepared by diluting a 40% emulsion of polyvinyl acetate with a highly viscous solution of the medium-viscosity type of SCS and adding a pigment.

Cosmetic and pharmaceutical preparations can be formulated using SCS as the thickening and suspending agent. For example, liquid cleansing creams, brushless shave creams, hand lotions, and dentifrices were prepared by using published procedures and substituting the sulfate ester for the thickening agent designated in the original formula (4). It was found that the medium-viscosity type could satisfactorily replace such thickening agents as sodium alginate, methyl cellulose, gum tragacanth, gelatin, and quince seed mucilage in cosmetic preparations.

Emulsion-Stabilizing Agent—When used in conjunction with a surface-active agent, SCS is a good stabilizer for oil-in-water emulsions. Stable emulsions of olive oil were prepared by rapidly mixing the oil with a 2% solution of the medium-viscosity type of product containing a small amount (0.1%) of sodium lauryl sulfate. In this manner it was possible to prepare emulsions containing up to 30% (by volume) of olive oil.

This emulsion-stabilizing property of SCS together with its excellent thickening and suspending qualities, should be of value in the food industry.

Film-Forming Agent—Films of SCS have unique properties, and thus have many potential uses. Since the films are oil-proof, they could be used in the manufacture of paper containers for oils, greases, paints, chemicals, and oil-containing foods. To illustrate this oilproof property, a paper (fiberboard) container was dewaxed and then coated on the inside with a film of SCS. The container was then filled with a lightweight motor oil and set aside. After two years there was still no indication of oil seepage through the walls of the container.

Since films of cellulose sulfate adhere readily to cellulose, the products should be a good sizing agent for paper and for textile fibers such as cotton and viscose. In the paper field, for example, the product should control the penetration of printing inks and increase the strength of the paper. In the textile field, the product should function as a fiber-protecting size during the weaving process, or as a fabric size in finishing operations.

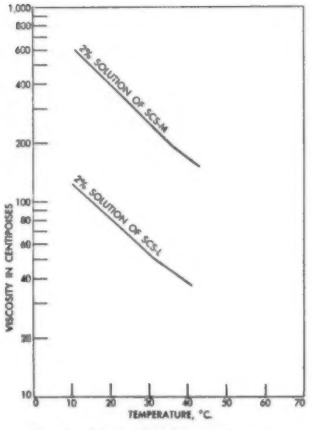


Fig. 3—Effect of rising temperature on the viscosity of two SCS solutions

Another valuable property of SCS films is non-flammability. This property might be utilized to advantage in electrical insulations in which exposure to the weather is not involved.

Adhesives—SCS is an excellent adhesive for porous materials, such as paper and wood. A wood glue with a moderate resistance to water was prepared by the addition of 1 part of glyoxal to 10 parts of a 6% solution of the low-viscosity type of material. A thin film of SCS on paper becomes adhesive when moistened. Since such films possess the added advantage of being non-hygroscopic, they are well suited for use on labels and envelopes.

The medium-viscosity type could be used as a viscosity-modifying agent for other glues too thin to be used alone. To illustrate this, two solutions were prepared; one contained 10 g. of dextrin and 1 g. of SCS dissolved in 90 g. of water, and the other contained 40 g. of dextrin in 90 g. of water. Both solutions had approximately the same viscosity and adhesive characteristics.

Creaming Agent For Rubber Latices—The creaming of natural and synthetic rubber latices with various hydrophilic compounds has been discussed in a number of papers (7, 9, 3). Usually 0.1% of the creaming compound, based on the rubber content of the latex, causes the latex to separate into two layers, one containing a high concentration of rubber, and the other containing only a slight amount of rubber. This creaming process enables the manufacturer to concentrate the latex and thereby reduce its shipping cost.

The medium-viscosity type of SCS was found to be an excellent creaming agent for natural rubber and neoprene latices. The most effective concentration was 0.2 to 0.5%, based on the rubber content of the latex.

Miscellaneous Uses—Most of the suggestions that have been made concerning the uses of SCS are based on laboratory investigations. However, there are many potential applications of the product which have not been investigated, but which become obvious when its properties are studied.

The adhesive property of SCS offers a wide range of uses other than those already mentioned for paper and wood. Thus, the product should function as a binding agent in the compounding of medicinal capsules and in the preparation of shoe polishes, crayons, and abrasive papers.

Since SCS can serve as a protective colloid, it should be of value in the bead and emulsion polymerization of vinyl monomers.

Compounds with properties similar to those of SCS have been used with success as beater sizes in the manufacture of paper possessing increased strength. It appears likely that the sulfate ester could also be used in this capacity.

Two other potential uses of SCS which should be of interest in the medicinal field are in forming water-soluble capsules, and in preparing bulk laxatives.

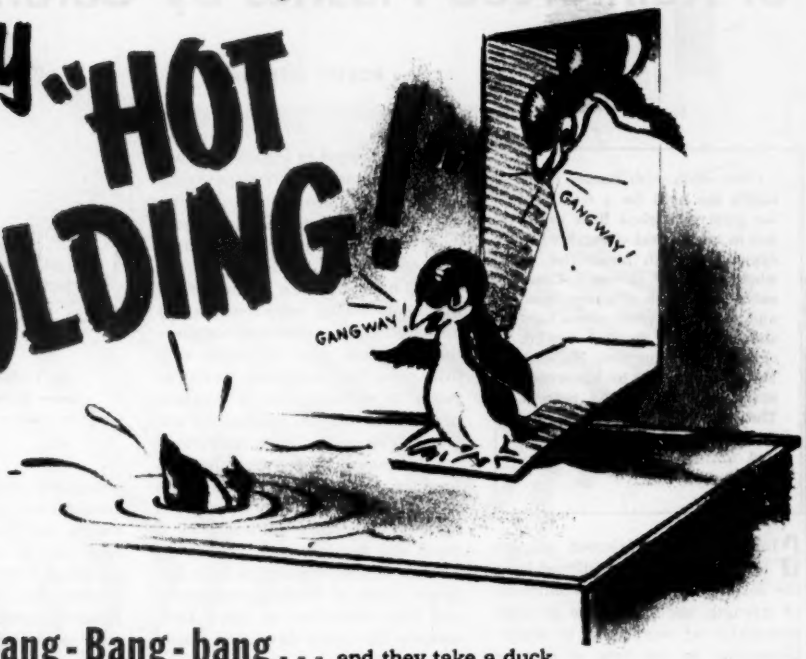
Summary

Sodium cellulose sulfate is a new, hot- and cold-water-soluble cellulose derivative which is being produced experimentally in two viscosity types—medium and low.

The physical properties of SCS have been determined. It is an odorless, non-flammable, non-hygroscopic, pale yellow powder which is insoluble in organic solvents. The viscosity of its aqueous solutions increases with increase in concentration, and decreases with rise in temperature. These solutions are compatible with a variety of other wa-

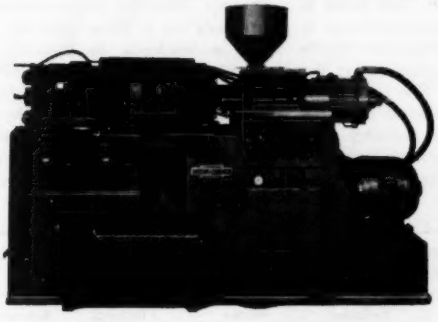
(*Continued on p. 183*)

Quicker'n you can say "HOT MOLDING!"



Bang-Bang-bang . . . and they take a duck in the water tank for safety cooling. The 10-shots-a-minute cycling of a Fellows 3 oz. machine can well call for water quenching.

● If speed means money to you, here's something you'd better know about! Say when—and we'll bring you the full report.



Fellows Model 18-3-15

Fellows LEOMINSTER

injection molding equipment

THE FELLOWS GEAR SHAPER CO., Plastics Machine Div., Head Office & Export Dept., Springfield, Vt. Branch Offices: 616 Fisher Bldg., Detroit 2. 640 West Town Office Bldg., Chicago 12 • 2206 Empire State Bldg., New York 1 • New England Distributor: Leominster Tool Co., Leominster, Mass.

Improvement of Wet Strength of Reinforced Plastics by Garan Finish

by ROBERT STEINMAN*

Glass cloth with Garan finish fulfills the need for a treatment for glass that gives little or no loss in mechanical strength when exposed to high humidities or when immersed in water. Laminates made with this new finish and various polyester resins have shown losses in flexural strength of less than 10 percent. Moisture absorption after 24 hr. immersion has been less than 0.1 percent. The laminates are colorless and the treated glass cloth is readily and uniformly wetted by polyester resins.

GLASS-FIBER-reinforced polyester laminates have suffered from the serious handicap of impairment of strength upon exposure to high humidities or immersion in water. Depending on the type of size or finish on the glass fabric, the loss in flexural strength ranged from 25 to 40% for the methacrylato chromic chloride treatment[1] to 40 to 60% for desized or heat-cleaned cloth. The flexural strength of random chopped fiber or strand reinforced materials decreased 35 to 50 percent. The loss is a function of both the size on the glass fibers and the binder used to hold the fibers together prior to molding or laminating. Data on the effect of moisture absorption on the flexural properties of a laminate made with glass fabric finished with methacrylato chromic chloride are shown in Table I for varying exposures.

The need for an improved finish to eliminate or decrease the loss in strength due to moisture has long been realized by the armed forces, the air-frame manufacturers, and the commercial laminators. Not only is a finish needed to improve the wet strength retention of glass fabric laminates, but also an improved size and binder for strands and yarns used in mat and preform moldings. The problem of developing an improved finish and size is complicated by the following requirements: 1) formulation of a chemical composition that will give laminates with little or no loss in strength when exposed to moisture; 2) a practical process that can be handled on existing finishing and glass fiber forming equipment; 3) a system that will produce uniformly finished cloth consistently; and 4) a suitable method of quality control that is rapid and accurate.

After extended trials on two different types of finishing equipment and after evaluation by many laminators, the newly developed Garan finish was found to meet all of the desired requirements. This finish is applied from an aqueous solution to glass cloth on conventional textile treating equipment suitable for the handling of fabrics. The production rates are commensurate with the best practices of the industry. The wet strength retention of laminates made with the finished cloth is independent of the quantity of active composition applied to the fabric during the finishing operation, except for an established allowable minimum concentration. Identical results are obtained within wide limits of concentration. Further, no color is imparted to the glass fabric by the new finish. The methacrylato chromic chloride finish imparts a greenish tint to glass cloth and also has a tendency to migrate and streak. This results in an uneven application with areas of higher methacrylato chromic chloride concentration. When cloth containing such areas of higher concentration is laminated, the physical properties

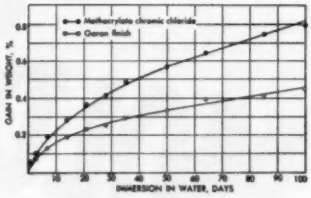


Fig. 1—Water absorption occurring at room temperature of laminates made by vacuum bag method at 250° F.

Table I—Effect of Moisture Absorption on the Flexural Properties of a Glass-Cloth Polyester Laminate After Prolonged Exposure[a]

Exposure time	*Temperature*	*Relative humidity*	*Water absorption*[b]	*Flexural strength*	*Retention of strength*[c]
days	°F	%	%	*p.s.i.*	%
72	73	50	0.061	60,260	100.0
72	75	64	0.241	53,950	89.6
72	75	80	0.495	48,810	81.1
75	75	100	0.896	43,200	71.8
75	100	100	0.927	42,500	70.5
75	75	Water immersion	0.844	44,410	73.7

[a] Source: Forest Products Laboratory Report No. 1819 (Oct. 1950). Fabric 181 with methacrylato chromic chloride (finish 114) was used to make the laminate.
[b] In percentage of conditioned weight.
[c] In percentage of strength at 73° F. and 50% humidity.

* Garan Chemical Corp.
[1] Applied to heat-cleaned cloth by the following finishers as: Finish 114—Owens-Corning Fiberglas Corp., Toledo, Ohio; F-14 Finish—Coast Mfg. & Supply Co., Livermore, Calif.; V-14 Finish—Glass Fibers Inc., Toledo, Ohio.

Rakes manufactured by A. C. I. Plastics Pty. Ltd., Spotswood, Victoria, AUSTRALIA.

New garden rakes, molded in Australia from tough, colorful Tenite, are much in demand by homeowners down under. Skillfully cast in one piece, the rakes form sturdy yet lightweight implements.

Most interesting design feature: their resilient, symmetrically curved teeth, calculated to make a clean sweep with each easy stroke. Use of Tenite not only permits flexibility, but also insures a rake that is shatterproof, noncorrodible, and exceptionally durable.

On our own side of the world, lustrous Tenite is of course an ever-popular material. Readily molded or extruded, it lends high impact strength and limitless color to a long list of products, such as screw driver handles, vacuum cleaner nozzles, football helmets, and adding machine keys. For further information about the properties and many applications of Tenite, write Tennessee Eastman Company, Division of Eastman Kodak Company, Kingsport, Tennessee.

TENITE *an Eastman plastic*

Information regarding Tenite is also obtainable through representatives located in Chicago, Cleveland, Dayton, Detroit, Leominster (Mass.), Los Angeles, New York, Portland (Ore.), Rochester (N. Y.), St. Louis, San Francisco, and Seattle; and elsewhere throughout the world from Eastman Kodak Company affiliates and distributors.

Table II—Comparison of Wet[a] and Dry Flexural Strengths of 181-Garan Laminates Made with Various Polyester Resins

Panel number	Resin	Flexural strength		
		Dry	Wet	Strength retention
		p.s.i.	p.s.i.	%
1	A	59,200	58,000	98.0
2	A	65,200	60,575	92.9
3	A	60,300	58,400	96.8
4	A	61,300	58,300	95.2
5	B	57,900	53,900	93.1
6	B	51,400	48,300	94.0
7	C	59,050	55,040	93.2
8	C	59,900	54,400	90.8
9	C	60,200	55,500	92.1
10	E	62,700	59,400	94.7
11	E	56,400	54,900	97.5
12	E	55,700	53,900	96.7
13	E	58,000	55,250	95.2
14	F	56,550	55,580	98.2
15	G	65,900	65,300	99.3
16	H	54,400	49,800	91.7
17	I	63,500	60,300	95.0
18	I	65,200	63,700	97.7
19	J	50,050	47,500	95.1
20	K	70,950	68,630	96.8

[a] Tests made on specimens that were boiled for 2 hr. in water, cooled to room temperature in water, and tested while wet. This test is equivalent to at least 30 days immersion in water.

of the laminates are found to be impaired in these areas.

A rapid quality control procedure has been developed for glass cloth with the new finish. Portions of treated glass are taken directly from the processing operation and are titrated directly for the amount of active ingredient present on the glass fabric. Periodic checks are also run on laminates made with the treated cloth. The flexural strength of these laminates is determined both dry and wet. The wet strength determination is made by boiling the test pieces in water for 2 hr., cooling to room temperature in water, and testing the pieces while wet. This procedure is based on the finding that the 2-hr. boil in water test is equivalent to at least 30 days immersion in water[2]. The use of these two procedures on the finished fabric allows for positive control.

Figure 1 shows effect of immersion in water at room temperature for 100 days on laminates made by the vacuum bag void-free technique. The water absorption of laminates made with the Garan finish is about half that of the laminates made with the methacrylato chromic chloride finish. The laminates were made with Resin A—a low viscosity polyester of the alkydstyrene type catalyzed with 1% of benzoyl peroxide. Twelve plies of 181 glass cloth with each finish were parallel laminated using the same batch of catalyzed resin. The wet laminates were laid side by side on the same metal plate and one vacuum bag was used to apply pressure to the two laminates simultaneously. After the air was worked out of the two panels, the panels were cured for 2 hr. in an oven at 250° F. The resin content of the Garan finish panel was 42.7% and that of the methacrylato chromic chloride panel was 42.6 percent. The average thickness of the two panels was the same. The average Barcol hardness was 70 for both panels.

The effect of a pressure cure on water absorption was also investigated. Laminates were made from 181 glass fabric with the Garan finish and with the methacrylato chromic chloride finish. Twelve plies of the treated glass fabrics were parallel laminated with Resin A previously catalyzed with 1% of benzoyl peroxide. The wet laminate was laid between cellophane and the air worked out by hand. The laminate was then transferred to a platen press previously heated to 250° F. The panels were cured for 1 hr. at 250° F. and 14 p.s.i. pressure. The panel made with the Garan finish had a resin content of 39.3% and had an average Barcol hardness of 69. The methacrylato chromic chloride panel had a resin content of 38.4% and an average Barcol hardness of 71. The laminates made with

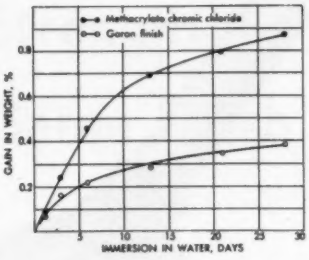


Fig. 2—Water absorption at room temperature of laminates made at 250° F. and with platen pressure of 14 p.s.i.

a press cure gave the same general water absorption curve as the vacuum bag cure. The Garan finish laminate had a water absorption of 0.376% compared to 0.87% for the methacrylato chromic chloride finish panel after 28 days immersion in water (Fig. 2).

The properties of an average laminate made with a typical polyester resin and 181 glass fabric with the Garan finish are as follows: flexural strength, dry—63,200 p.s.i.; flexural strength, 2-hr. boil, wet—60,575 p.s.i.; tensile strength, dry—43,700 p.s.i.; tensile strength, 2-hr. boil, wet—42,900 p.s.i.; compressive strength, dry—39,600 p.s.i.; compressive strength, 2-hr. boil, wet—36,300 p.s.i.; resin content—37.8%; water absorption, 24-hr.—0.066%; water absorption, 28 days—0.376%.

In order to determine whether the improvement in wet strength retention was a characteristic of the particular polyester resin used in the above tests or an improvement that could be expected with any poly-

(*Continued on p. 184*)

Table III—Comparison of Wet[a] and Dry Flexural Strengths of 181 Glass Fabric Base Polyester Resin Laminates with Garan Finish and Methacrylato Chromic Chloride Finish

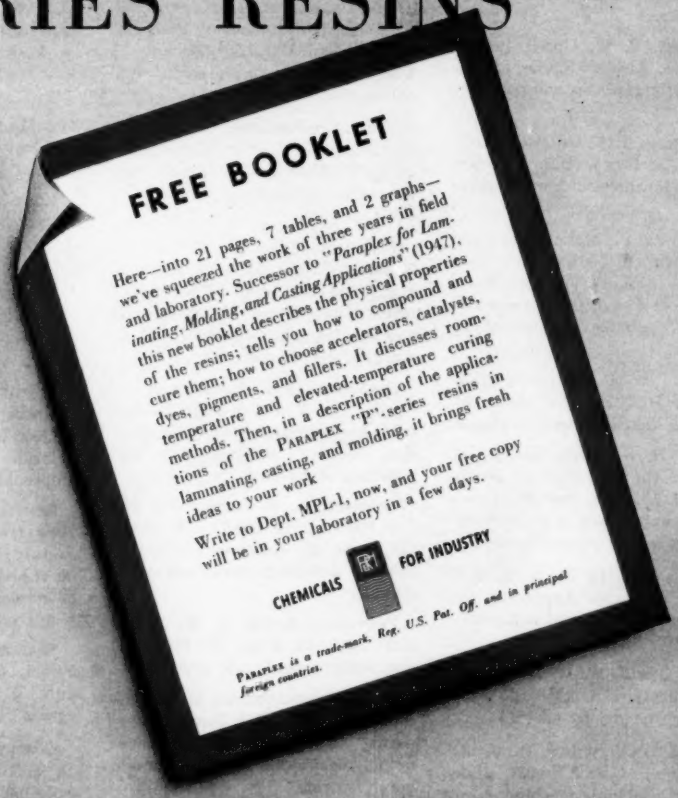
	Garan finish			Methacrylato chromic chloride		
	Flexural strength		Strength retention	Flexural strength		Strength retention
	Dry	Wet		Dry	Wet	
	p.s.i.	p.s.i.	%	p.s.i.	p.s.i.	%
Resin A	61,300	58,300	95.2	59,600	38,500	64.5
Resin C	59,050	55,040	93.2	62,200	37,900	61.0
Resin D	65,900	65,300	98.9	57,300	34,400	60.0
Resin E	62,700	59,400	94.7	63,500	40,600	64.0
Resin K	70,950	68,630	97.0	62,530	39,000	62.3

[a] Tests made on specimens that were boiled for 2 hr. in water, cooled to room temperature in water, and tested while wet. This test is equivalent to at least 30 days immersion in water.

[2] Meeting on finishes held at Wright-Patterson Field, Dayton, Ohio, on Mar. 22, 1951.

The

PARAPLEX "P" SERIES RESINS


FREE BOOKLET
Here—into 21 pages, 7 tables, and 2 graphs—we've squeezed the work of three years in field and laboratory. Successor to "Paraplex for Laminating, Molding, and Casting Applications" (1947), this new booklet describes the physical properties of the resins; tells you how to compound and cure them; how to choose accelerators, catalysts, dyes, pigments, and fillers. It discusses room-temperature and elevated-temperature curing methods. Then, in a description of the applications of the PARAPLEX "P"-series resins in laminating, casting, and molding, it brings fresh ideas to your work
Write to Dept. MPL-1, now, and your free copy will be in your laboratory in a few days.
CHEMICALS FOR INDUSTRY
PARAPLEX is a trade-mark, Reg. U.S. Pat. Off. and in principal foreign countries.

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

WASHINGTON SQUARE PHILADELPHIA 5, PA.

U. S. PLASTICS PATENTS

Copies of these patents are available from the U. S. Patent Office, Washington, D.C., at 25¢ each.

BONDING. A. J. Barry (to Dow Corning). U.S. 2,557,778, June 19. Bonding rubber to glass with a hydro-polychlorosilyl addition product of an elastomeric hydrocarbon.

SILANES. H. A. Clark (to Dow Corning). U.S. 2,557,782, June 19. Method of preparing linear chlorosilphenanes.

POLYMERS. R. W. Upson (to Du Pont). U.S. 2,557,805, June 19. Dialkyl vinyl phosphates and polymers thereof.

COPOLYMERS. R. F. Boyer and L. C. Rubens (to Dow). U.S. 2,557,903, June 19. Diolefin-aconitrate copolymers.

RESINS. A. P. Mazzucchelli and P. F. Urich (to Carbide and Carbon). U.S. 2,557,922, June 26. Reaction product of a novolak resin and an amino diphenyl-formaldehyde compound.

SILANES. A. J. Barry (to Dow Corning). U.S. 2,557,931, June 26. Phenylene linked organopolysilanes.

RESINS. H. S. Bloch and R. B. Thompson (to Universal Oil Products). U.S. 2,557,935, June 26. Resinous reaction products of an aromatic polyketone and a polysulfonamide.

HEAT SEALING. D. M. King. U.S. 2,557,975, June 26. Apparatus for heat-sealing the ends of a thermoplastic tube.

DRYING OIL. Z. W. Wicks, Jr. (to Interchemical). U.S. 2,558,025, June 26. A polyester drying oil.

MOLDING. G. C. Wilson (to Armstrong Cork). U.S. 2,558,027, June 26. Injection molding machine.

COLD DRAWING. P. W. Bridgeman. U.S. 2,558,035, June 26. Apparatus for cold drawing plastic material under hydraulic pressure.

CELLULOSE DERIVATIVE. W. E. Gloor (to Hercules). U.S. 2,558,047, June 26. Thermoplastic cellulose ester plasticized with a polymerizable compound whereby a heat-convertible molding composition is obtained.

DENTAL MATERIAL. F. E. Knock and J. F. Glenn (to L. D. Caulk). U.S. 2,558,139, June 26. Methyl methacrylate, a tertiary phenyl ethanolamine, and a peroxy catalyst.

VINYL CHLORIDE. A. Gislon and J. Quiquerez (to Compagnie Francaise de Raffinage). U.S. 2,558,177, June 26. Vinyl chloride resin plasticized with chlorinated aralkyl hydrocarbons.

VINYL COMPOSITIONS. R. K. Petry (to Delaware Floor Products). U.S. 2,558,378, June 26. Plasticized vinyl resin-filler composition for floor and wall covering.

RESINOUS COMPOSITION. W. M. Thomas (to American Cyanamid). U.S. 2,558,396, June 26. Producing beads of a copolymer of ethylacrylate and acrylonitrile plasticized with *o*-cresyl glyceryl ether.

POLYMERS. G. E. Rumscheidt (to Shell). U.S. 2,558,498, June 26. Decalin-hydroperoxide catalyzed reaction between sulfur-dioxide and polymers of diolefins.

POLYMERS. G. E. Rumscheidt and J. T. Hackman (to Shell). U.S. 2,558,-527, June 26. Reaction product of rubbery diolefin polymer and sulfur dioxide.

POLYVINYL ESTERS. E. W. Eckey. U.S. 2,558,548, June 26. Polyvinyl ester-ester interchange process.

ORGANOPOLYSILOXANES. M. M. Safford. U.S. 2,558,560-1, June 26. Preparing flexible organopolysiloxanes by polymerizing in the presence of a boron hydride.

POLYMERS. F. Armitage, J. A. Cottrell, and D. H. Hewitt (to Sherwin-Williams). U.S. 2,558,667, June 26. Polymerizable succinic acid ester.

POLYAMIDES. P. J. Flory (to Wingfoot). U.S. 2,558,675, June 26. N-acyl polyamides of polycarboxylic acids.

RESINS. M. Landa (to Bata, norodni podnik). U.S. 2,558,688, June 26. Chlorinated phenol-aldehyde resol.

VINYL RESINS. G. M. Corbett and N. W. Abernethy (to Dow). U.S. 2,558,701, June 26. Light-stabilized vinyl chloride or vinylidene chloride resins.

THERMOSTABLE COMPOSITION. E. C. Britton and W. J. LeFevre (to Dow). U.S. 2,558,728, July 3. Polyvinylidene chloride heat-stabilized with ethylene-diamine tetra-acetic acid.

PRINTING. L. H. Smith and F. M. Smith (to Decora). U.S. 2,558,791, July 3. Method of continuously printing polyvinyl chloride sheet.

RESIN. H. S. Bloch (to Universal Oil Products). U.S. 2,558,812, July 3. Condensate of a phenol, an alkyl aromatic hydrocarbon, and a polyenic hydrocarbon.

LAMINATED TUBES. A. A. Hodge (to Holoplast). U.S. 2,558,849, July 3. Apparatus for manufacturing laminated tubes.

RODS. N. W. Knewstubb and C. A. Robb (to Carbide and Carbon). U.S. 2,558,855, July 3. Process for manufacturing rods of bonded fibrous material.

POLYMERS. S. O. Greenlee (to Devoe and Raynolds). U.S. 2,558,949, July 3. Polymeric polyether derivatives of dihydric phenols.

VINYL RESINS. J. Dazzi (to Monsanto). U.S. 2,559,146, July 3. Vinyl chloride resins plasticized with chlorophenoxy acetates.

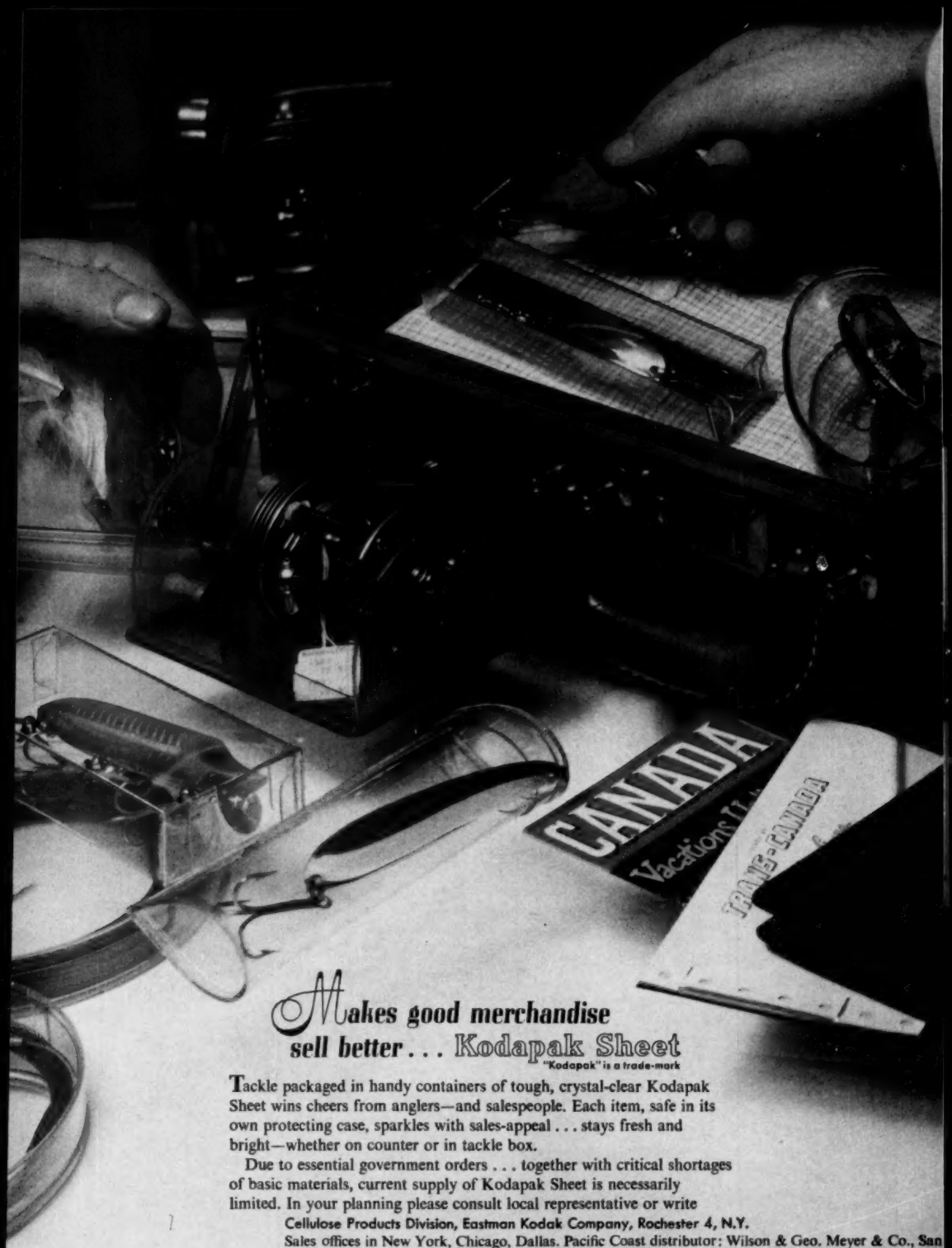
ACRYLONITRILE COPOLYMERS. G. E. Ham and E. C. Chapin (to Monsanto). U.S. 2,559,154, July 3. Method of preparing emulsion copolymers of acrylonitrile and vinyl acetate or a styrene.

SEALERS. S. S. Kurtz, Jr. and J. S. Sweely (to Sun Oil). U.S. 2,559,162, July 3. Thiourea-aldehyde sealing agents.

COPOLYMERS. R. R. Morner and D. T. Mowry (to Monsanto). U.S. 2,559,166, July 3. Copolymers of styrene and thionaphthene-1-dioxide.

SILICON POLYMERS. R. R. Myers (to Monsanto). U.S. 2,559,167, July 3. Process for preparing polymeric silicon oxychloride.

COPOLYMERS. W. C. Schneider and J. J. Padbury (to American Cyanamid). U.S. 2,559,172, July 3. Compo-



Makes good merchandise sell better . . . Kodapak Sheet

"Kodapak" is a trade-mark

Tackle packaged in handy containers of tough, crystal-clear Kodapak Sheet wins cheers from anglers—and salespeople. Each item, safe in its own protecting case, sparkles with sales-appeal . . . stays fresh and bright—whether on counter or in tackle box.

Due to essential government orders . . . together with critical shortages of basic materials, current supply of Kodapak Sheet is necessarily limited. In your planning please consult local representative or write

Cellulose Products Division, Eastman Kodak Company, Rochester 4, N.Y.

Sales offices in New York, Chicago, Dallas. Pacific Coast distributor: Wilson & Geo. Meyer & Co., San Francisco, Los Angeles, Portland, Seattle. Canadian distributor: Paper Sales Limited, Toronto, Montreal.

Tackle: courtesy of Abercrombie & Fitch Co.

sitions comprising copolymers of acrylonitrile and iminodipropionitrile.

POLYVINYL RESINS. D. E. Terry and D. H. Wheeler (to General Mills). U.S. 2,559,177, July 3. A polyvinyl ester resin plasticized with a fatty acid containing an epoxy group.

CASTING. J. S. Church and H. R. Tyler (to U.S.). U.S. 2,559,345, July 3. Dissolving polymethylmethacrylate in monomer thereof and casting at temperatures of 50° C. or less.

DRYING COMPOSITIONS. H. Dannenberg (to Shell Development). U.S. 2,559,347, July 3. A polyhydric alcohol ester of an unsaturated fatty acid and an alkylated phenol-aldehyde condensate.

RESIN. E. B. Detwiler (to American Cyanamid). U.S. 2,559,349, July 3. Melamine resin and acetanilide curing catalyst.

COPOLYMERS. F. B. Root (to Ellis-Foster). U.S. 2,559,465-6, July 3. Soluble copolymers of monomers and drying oil acids-unsaturated dicarboxylic acid-polyhydric alcohol esters.

RESINS. J. D. Barber, W. J. Sparks, and D. W. Young (to Standard Oil). U.S. 2,559,498, July 3. Resins from diisobutylene and cracked petroleum condensate.

MOLDING. A. M. Penrod (to Maryland Plastics). U.S. 2,559,545, July 3. Molding machine.

RESINS. T. J. Suen (to American Cyanamid). U.S. 2,559,578, July 10. Reaction product of urea-formaldehyde and an alkali salt of sulfurous acid.

RESINS. G. E. Barker (to Atlas Powder). U.S. 2,559,583, July 10. Solids containing polyoxyethylene esters, amines, or amides reacted with urea.

POLYMERS. W. O. Kenyon, T. T. M. Laakso, and C. C. Unruh (to Eastman Kodak). U.S. 2,559,635, July 10. Polymers of alkyl alpha-acyloxy acrylates.

ABRASIVE. K. G. Ries, N. P. Robie, and P. von Doenhoff (to Carborundum). U.S. 2,559,664-5, July 10. Abrasive comprising a heat-hardening resin and a thermoplastic resin.

POLYMERIZATION. E. Zerner, M. Gradsten, and F. W. West (to Sun Chemical). U.S. 2,559,694, July 10. Acrylyl-triazine polymerizates.

SHEETS. G. W. Borkland. U.S. 2,559,705, July 10. Apparatus for drawing thermoplastic sheets.

DISPERSIONS. K. L. Berry (to Du Pont). U.S. 2,559,750-2, July 10. Aqueous dispersions of polytetrafluoroethylene and means for coagulating.

POLYMERS. C. F. Peters (to Velsicol). U.S. 2,559,790, July 10. Cyclopentadiene-vinyl acetate polymers.

POLYESTER. T. F. Anderson (to Libbey-Owens-Ford). U.S. 2,559,837-8, July 10. Thermosetting polyesters containing dihydroxydiphenyls or thiophenols.

POLYMERS. J. B. Dickey and H. W. Coover (to Eastman Kodak). U.S. 2,559,854, July 10. Acrylic acid esters containing a dialkyl phospheno group and polymers thereof.

RESIN FOAM. L. S. Meyer (to Libbey-Owens-Ford). U.S. 2,559,891, July 10. Foamed urea-formaldehyde.

CELLULOSE ESTERS. G. Frank. U.S.

The A'B'C's of
PLASTIC FABRICATING
(ACRYLIC AND ROYALITE)

AMPLEX MANUFACTURING CO.
—A leader in the field of Acrylic and Royalite plastic fabrication.

BETTER WORKMANSHIP
—Due to a better knowledge of the basic materials and fabricating processes, plus the most modern equipment.

CLOSER COOPERATION
—Between you and our engineering staff results in the best solution to any problems.

Forming, Free Blowing, Vacuum Forming, Machining, Assembling, etc.

Amplex MANUFACTURING CO.

WRITE NOW!
Dept. M
2325-31 FAIRMOUNT AVE.
PHILADELPHIA 30, PA.

WELD and SPRAY THERMOPLASTICS with...

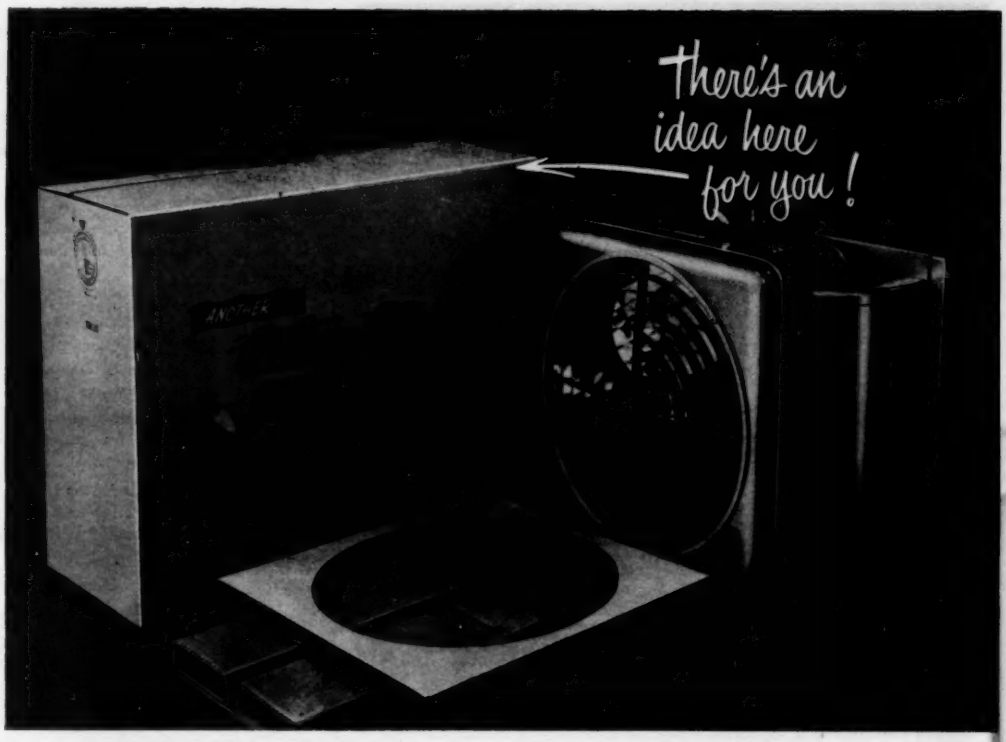
Agile HOT GAS WELDING GUN

for welding of Polyethylene Polyvinyl Chloride, etc.; electrically and acetylene heated types available.

Agile FLAME SPRAY GUN

for spraying of metallic surfaces with thermoplastic coatings in powder form without need for solvents.

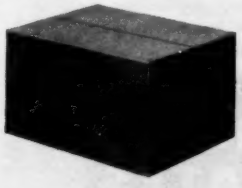
AMERICAN AGILE CORPORATION
5806 HOUGH AVENUE
CLEVELAND 3, OHIO



Fans breeze through the shipping department in this H & D corrugated shipping box

Time spent packing goods for safe shipment often is a sizeable business expense—and with highly seasonal products, packing time can be an actual production bottleneck. The makers of Atlas-Aire fans solved their rush-season packing problem with this H & D corrugated box. Built-up pads replace the time-wasting packings formerly used, and protect the fans so well that damage claims now are negligible.

The Package Laboratory is ready to help with your packing problem, whether you're anxious to reduce packing time, or to cut costs . . . improve display . . . or provide better protection. For booklet, "Package Engineering," write Hinde & Dauch, 5106 Decatur St., Sandusky, Ohio.

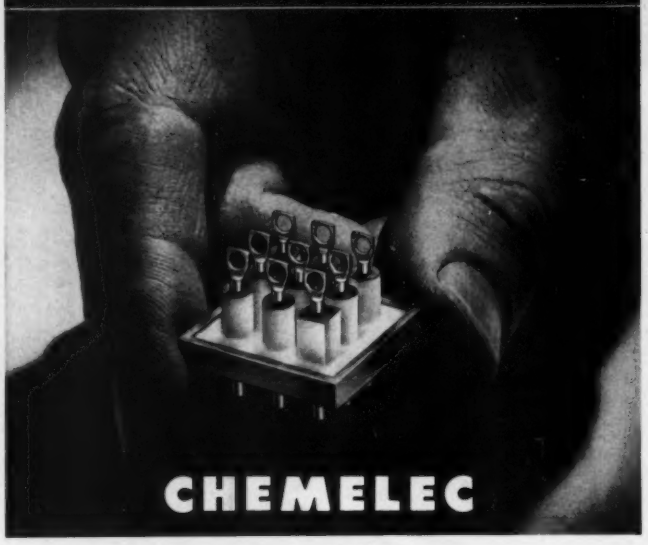


H&D®

Authority on Packaging

FACTORIES IN: Baltimore • Buffalo • Chicago • Cleveland Detroit • Gloucester, N. J. • Hoboken, N. J. • Kansas City, Kan. Lenoir, N. C. • Richmond, Va. • Sandusky, Ohio St. Louis • Watertown, Mass. *Offices in principal cities.*

FIRST WITH TEFLON



CHEMELEC

Hermetically Sealed Transformer Terminals
(patents pending)

Another excellent example of "Engineered fluorocarbons"—these transformer terminals utilize the United States Gasket Company's exclusive method (Patents Pending) of producing a fused hermetic seal between TEFLON and metals.

These terminals withstand severe mechanical shock and vibration and thermal shock. There is no strain-point as with fused glass-to-metal or ceramics-to-metal seals. They facilitate assembly as there is no danger of breakage. Another of many advantages—complete absence of DC plating.

Throughout industry, materials men are finding TEFLON's unique combination of properties—plus United States Gasket Company *Application Engineering*—the answer to many tough problems.

If you require a material that is inert to all acids, caustics, solvents, mechanically tough, heat resistant, extremely anti-hesive and wear resistant; that has zero water absorption, is unaffected by extreme humidity and fungus; that is an ideal electrical insulator, especially where high and low ambient temperatures and frequency stability are problems; that may be fused to or "alloyed" with metals, carbon, silicate, glass, etc., to open other broad fields of application . . . ask for catalog No. 300 or write stating your problem.

UNITED STATES GASKET COMPANY

TEFLON PRODUCTS DIVISION

650 N. 10th ST., CAMDEN 1, N. J.

2,559,914, July 10. Process for production of cellulose sulfuric acid esters.

RESIN. R. Lindenfelser (to American Cyanamid). U.S. 2,559,976, July 10. Reaction product of aromatic amine and melamine-formaldehyde.

ADHESIVE. W. J. Nanfeldt (to Firestone). U.S. 2,560,033, July 10. Friction element bonding film containing butadiene-acrylonitrile and phenolic resins.

SHEET STRETCHING. J. E. Trainer (to Firestone). U.S. 2,560,038, July 10. Plastic sheet stretcher.

POLYACRYLONITRILE. M. Q. Webb (to Du Pont). U.S. 2,560,053, July 10. Mixture of a sulfhydryl substance and a sulfoxy acid for stabilizing polyacrylonitrile solutions.

RESINS. J. W. McCaslin and J. C. Hillyer (to Phillips Petroleum). U.S. 2,560,119, July 10. Tetrahydrophthalic anhydride resins.

STABILIZERS. F. S. Deutsch and L. H. P. Weldon (to British Resin Products). U.S. 2,560,160, July 10. Stabilization of polymeric resins with bismuth salts.

POLYMERS. J. D. Garber (to Standard Oil). U.S. 2,560,164, July 10. Friedel-Crafts treatment of unsaturated polymers.

POLYMERIZATION. D. E. Sargent (to General Aniline). U.S. 2,560,251, July 10. Process for polymerization of N-vinyl compounds.

MOLD. J. L. Howie, Jr. (to Grigoleit). U.S. 2,560,291, July 10. Apparatus for molding threaded articles.

RESIN. T. R. McElhinney (to Valite Corp.). U.S. 2,560,299, July 10. Resinous reaction products of a phenol with aldehydes and ketones obtained by acid hydrolysis of lignocellulosic materials.

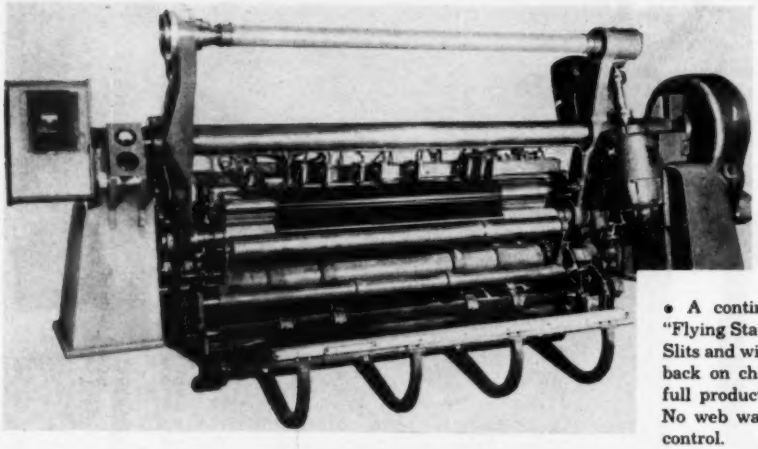
RESINS. H. J. West and H. M. Enterline (to American Cyanamid). U.S. 2,560,319, July 10. Heat-stabilized plasticized amino-triazine resin compositions.

CONDENSATES. E. Lieber and E. P. Cashman (to Standard Oil). U.S. 2,560 355, July 10. Condensates of silicon halides with chlorowax-napthalene or chlorowax phenol.

DRILLING COMPOSITION. G. G. Wrightsman (to Standard Oil). U.S. 2,560,380, July 10. Condensate of an aldehyde and a hydroxybenzene

CUSTOM MOLDED PLASTICS
• ADMIRAL
• ARVIN
• CAPEHART-FARNSWORTH
• SEEGER REFRIGERATORS
• INTERNATIONAL HARVESTER
• INTERNATIONAL REGISTER
• MINNEAPOLIS HONEYWELL
• MOTOROLA
• PHILCO
• RCA
• CROSLEY
• DELCO
• ZENITH
PHILCO
355 N. CRAWFORD AVENUE, CHICAGO 24, ILL., Phone SAcramento 2-2900
REPRESENTATIVES: GEORGE H. TIMMINGS & CO., 1802 N. DAMEN AVE., CHICAGO 47, ILL. • QUIRSFELD BROS., 120 E. 9TH ST., INDIANAPOLIS 2, INDIANA • STANLEY J. ROBERTS & E. H. VANNORWICK, 5 235 GENERAL MOTORS BLDG., DETROIT 2, MICH. • C. E. WHITE & CO., BULKLEY BLDG., CLEVELAND 15, O. • WILLIAM S. RICHARDS COMPANY, NO. 2 S. BRENTWOOD BLVD., CLAYTON, ST. LOUIS 5, MISSOURI • E. J. EDMUNDS, 5344 IRVING ST., PHILADELPHIA 39, PENN.
INJECTION MOLDING • METAL STAMPING • ELECTRO-MECHANICAL ASSEMBLIES

KOHLER SYSTEM PLASTIC WINDER



controlled production-plastic winding

• A continuous winder with Kohler "Flying Starter." Employs no adhesives. Slits and winds without wrinkles or fold back on changing of cone sizes and at full production speeds. No down time. No web waste or relaxation of tension control.

Write, call or wire **Dilts** for complete data

DILTS MACHINE WORKS, Fulton, New York
Division of The Black-Clawson Co., Hamilton, Ohio

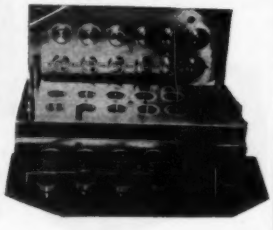
SAVE TIME and MONEY

by letting us create

Pre-Mold Models

We follow through with

Quality *tested* ***Production Molds***



INJECTION
COMPRESSION
TRANSFER MOLDS

STRICKER-BRUNHUBER CORP.
Mechanical Developers
19 WEST 24th ST. NEW YORK 10, N. Y.

This LIBERTY BELL BANK has a free plan story for polystyrene molders!

Now you can free yourself from troublesome polystyrene lacquer problems!

Follow the example of Art Plastics Company, Leominster, Mass., manufacturers of this fast-selling Liberty Bell Bank. Use New England lacquer to give your product decorative, scratch-resistant colors — and to free yourself from costly production headaches!

New England lacquer offers you high gloss, excellent adhesion, and good color retention, along with blush-resistant, quick-drying qualities. It's the polystyrene finish you've been looking for!

Declare your independence from lacquer problems now. Write for complete details about New England lacquer today!

FREE! *Send for descriptive booklet, "New England Lacquer for Molded Polystyrene".*

NEW ENGLAND LACQUER COMPANY
102 KING PHILIP ROAD, EAST PROVIDENCE, R. I.

CELLULOSE ACETATE

Molding Powders

all colors ***all flows***

Franklin Jeffrey has just placed in operation a new production line for the manufacture of cellulose acetate molding powders.

Custom Compounding

For your convenience Franklin Jeffrey maintains complete facilities for custom compounding all thermoplastic materials and for reclaiming your scrap materials.

FRANKLIN JEFFREY CORPORATION

Manufacturer and Custom Compounder of All Plastic Materials

1671 McDonald Avenue Brooklyn 30, N. Y.

COTTON FABRICS

FOR

COATING

AND

LAMINATING

★

J.H. LANE & CO., Inc.

250 W. 57th St. • New York, N. Y.

carboxylic acid as mud drilling composition.

COPOLYMERS. W. J. Sparks and D. W. Young (to Standard Oil). U.S. 2,560,492, July 10. Copolymerizate of styrene and a polyolefin formed with a Friedel-Crafts catalyst.

POLYMERS. P. O. Tawney (to U.S. Rubber). U.S. 2,560,495, July 10. Interpolymers of polyolefinic 2-alkenyl olefinic alcohol esters with crotonaldehyde.

SILOXANES. E. L. Warrick (to Corning Glass). U.S. 2,560,498, July 10. Copolymeric siloxane elastomers.

RESIN. C. J. Opp and R. E. Werner (to Interchemical). U.S. 2,560,592, July 17. Reaction product of a partial ester and a polybasic acid compatible with urea- or melamine-aldehyde resins.

ACRYLONITRILE. A. L. Allewelt (to American Viscose). U.S. 2,560,680, July 17. Copolymerizates of acrylonitrile with a monoamide.

CONDENSATE. F. C. Schaefer (to American Cyanamid). U.S. 2,560,-825, July 17. Autocondensates of an aryloxy aminotriazine.

RUBBER HYDROCHLORIDE. C. M. Carson (to Wingfoot). U.S. 2,561,010-1, July 17. A non-fogging film of rubber hydrochloride containing a long chain polyoxyethylene ether of palmitic acid partial ester.

HALOGENATED RESINS. M. Baer (to Monsanto). U.S. 2,561,044, July 17. Polyvinyl chloride stabilized with an organometallic lead salt of an alpha, beta-olefinic carboxylic acid.

POLYMERIZABLE MONOMERS. D. C. Pease (to Du Pont). U.S. 2,561,068, July 17. Preparation of polymerizable long chain esters and nitriles.

COPOLYMERS. P. O. Tawney (to U.S. Rubber). U.S. 2,561,153, July 17. Soluble copolymers of allylic monoethers, poly-2-alkenyl esters and styrene.

SILICONE-RUBBER COMPOSITIONS. A. J. Barry (to Dow Corning). U.S. 2,561,177, July 17. A hydro-polyalkoxysilyl addition product of a rubber hydrocarbon.

SILOXANES. C. A. Burkhard (to G.E.). U.S. 2,561,178, July 17. Plasticized polysiloxane.

VINYL RESIN. R. N. Crozier, E. Lavin, and A. T. Marinaro (to Shawinigan Resins). U.S. 2,561,183, July 17. Vinyl acetal resin stabilized with urea-formaldehyde condensate.

LAMINATE. C. J. Mighton (to Du Pont). U.S. 2,561,215, July 17. Laminate, the binding agent of which is a copolymer of a diene and vinyl pyridine mixed with a polyhydric phenol-aldehyde resin.

PLASTIC TREATING. A. G. Rose (to Rose Bros.). U.S. 2,561,231, July 17. Mechanism for forming indentations in moving rods of plastic.

COPOLYMERS. T. P. Malinowski (to Monsanto). U.S. 2,561,313, July 17. Copolymers of alpha-methyl styrene and maleic anhydride.

POLYVINYL FORMAL. W. R. Richard (to Monsanto). U.S. 2,561,314-5, July 17. Polyvinyl formal plasticized with an alkyl phthalyl alkyl glycolate.

MOLDING. E. T. Gadd (to T. B. Mickelson). U.S. 2,561,356, July 24. Apparatus for removing flash from molded articles.

LAMINATES. I. W. Ruderman (to St. Regis Paper). U.S. 2,561,449, July 24. Glass fiber sheets bonded together

Du Bois PLASTIC

A few typical injection molded nylon parts recently produced at Du Bois.

how to gain the advantages of NYLON

Any "plastic molder" is not necessarily experienced in the molding of nylon. If you choose to have a part molded of nylon, select a molder with experience in producing parts to rigid specifications from this tough, versatile material.

Du Bois — one of the pioneers in nylon molding — is today recognized in the plastics industry as a leader in this field.

For a quotation on your blueprint and/or a factual summary of Du Bois facilities — write, wire or phone.

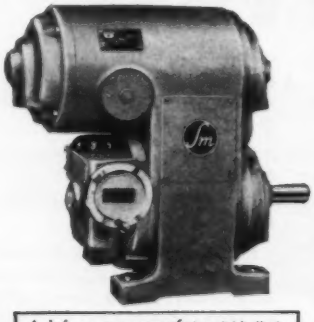
P.S. Du Bois is also Buffalo's leading compression and injection molder of all the thermosetting and thermoplastic materials.

DuBOIS PLASTIC PRODUCTS, INC.
168 Florida Street · Buffalo 8, N. Y. · Phone GA. 8188

power modernization

Even a brand new motor may be obsolete . . .

if you do not have control of speed



STERLING SPEED-TROL . . . Gives You Variable Speed Control Necessary For:

- **PROCESS CONTROL OF:** Temperature—viscosity—level—pressure—flow—etc.
- **TIME CONTROL OF:** Baking—drying—heating—cooking—pasteurizing—soaking—chemical action—etc.
- **EQUIPMENT ADAPTATION TO:** Load variation—sequence synchronization. Size—tension—hardness or shape of materials to be processed—machined—conveyed—blended—mixed—etc.
- **VARIATIONS IN:** Quality—quantity—operators' abilities—etc.

Ask for your copy of pictorial bulletin No. A-67 showing Sterling Electric Power Drives Turning The Wheels of Industry.

STERLING ELECTRIC MOTORS

Plants: New York 51, N. Y.; Los Angeles 22, California; Hamilton, Canada; Santiago, Chile. Offices and distributors in all principal cities.

with phenol-aldehyde resin and impregnated with phenol-aromatic amine-aldehyde resin.

POLYVINYL ACETALS. J. Bisch (to Compagnie de Produits Chimiques et Electro-metalurgiques Alais Froges et Camargue). U.S. 2,561,458, July 24. Hydrolyzing polyvinyl ester with hydrochloric acid and treating with an aldehyde.

CELLULOSE ACETATE. A. F. Caprio and R. L. Shuman (to Celanese). U.S. 2,561,493, July 24. Cellulose acetate plasticized with tri-(2,4-dichlorophenyl)-phosphate and stabilized with calcium lactate.

CONDENSATES. P. A. Devlin, R. R. Whetstone, and E. C. Shokal (to Shell Development). U.S. 2,561,613, July 24. Condensates of unsaturated ether-aldehydes and polymers thereof.

POLYMERIZATION. R. W. Dornte (to Standard Oil). U.S. 2,561,729, July 24. Polymerization of iso-olefins with Friedel-Crafts polymerizable complex catalyst.

COPOLYMER. W. C. Hollyday and W. J. Sparks (to Standard Oil). U.S. 2,561,796, July 24. Olefin haloaromatic copolymer.

POLYMERS. E. E. Novotny, G. K. Vogelsang, and E. E. Novotny (to Borden). U.S. 2,561,814, July 24. Reactive potentially curable polymers of halogenated addition products of aldehydes of mono hetero atomic five-membered rings.

ETHYL CELLULOSE. P. Van Wyck (to Hercules). U.S. 2,561,892-3, July 24. Ethyl cellulose stabilized with copper, brass, bronze, or an organic copper salt.

POLYETHYLENE. H. H. Roberts, Jr. (to Harvel Research). U.S. 2,561,951, July 24. Polyethylene dispersions.

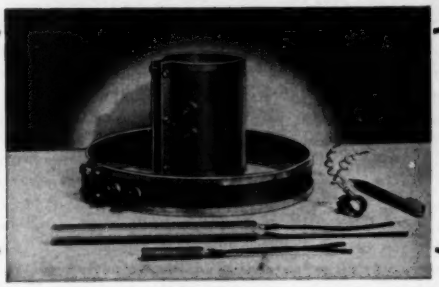
CONDENSATE. O. P. Cohen (to Monsanto). U.S. 2 561,973, July 24. Condensing urea and formaldehyde in the presence of an amine and a sodium compound.

SILOXANES. M. Sveda (to Du Pont). U.S. 2,562,000, July 24. Polyarylene-siloxanes.

CONDENSATES. R. Lindenfelser and D. G. Patterson (to American Cyanamid). U.S. 2,562,051, July 24. Reacting furfural with melamine-formaldehyde condensates.

HEAT FOR PLASTIC PROCESSING

You specify the size



ELECTRIC HEATERS of ALL TYPES

- For Machine Parts
- For Liquids
- For Air

ALSO SPECIAL REQUIREMENTS

INDUSTRIAL HEATER CO., INC.

1921-1951

245 Canal St. New York 13, N. Y.

FABRICATED IN THE 1st PLACE---
NEVER TO TAKE 2nd PLACE!!

Canister Set molded by Burroughs of California from TRU-CASTINGS.

"TRU-CAST" BERYLLIUM COPPER

Cast BY Master Craftsmen
FOR Master Craftsmen

QUALITY • SERVICE • SATISFACTION

BERYLLIUM COPPER AT ITS BEST
TRU-CAST by MANCO

MANCO PRODUCTS CO.
2401-2409 Schaefer Road
Melvindale • Michigan

"dag"
Concentrated Dispersions of Carbon Black

Produced either in granular form or as readily extendible pastes, Acheson Concentrated Carbon Black Dispersions give you a highly opaque product, possessing remarkable lustre and jetness without the use of toners . . . using in some cases as little as one-fifth of the ordinary colorant.

These predispersed carbon blacks are available for coloring polystyrene, polyethylene, ethyl cellulose, cellulose acetate and the vinyls.

They are literally dustless . . . will reduce processing time . . . minimize product contamination . . . shorten clean-up between runs.

Acheson Concentrated Carbon Black Dispersions and their utility in the plastics and coating industries are described in an interesting booklet. Call or write Acheson Colloids Corporation, Dispersed Pigments Division, 420 Lexington Ave., New York 17, New York, for your copy.

Acheson Colloids is equipped to do custom disintegrating, dispersing, and stabilizing of solids in a wide variety of vehicles. The dispersing of pigments and dyes to specification is one of our specialties. If you need this type of service, we may be able to help you.

Acheson Colloids Corporation

dag DISPERSIONS

PLASTICS DIGEST*

Abstracts from the world's literature of interest to those who make or use plastics or plastics products. Send requests for periodicals to the publishers listed.

General

SYNTHETIC FIBERS. Chem. Eng. *58*, 125-32 (Aug. 1951). The synthesis, properties, uses, and manufacturers of synthetic fibers—including those made of viscose rayon, cellulose acetate, nylon, polyacrylonitrile, acrylic copolymers, polyesters, vinyls, zeins, and glass—are reviewed.

MILITARY SPECIFICATIONS CONTROLLING PLASTIC DIELECTRICS. L. E. Siefert, Electrical Manuf. *47*, 100-4, 234, 236, 238 (Apr. 1951). The military specifications for plastic dielectric materials are analyzed and discussed. Why and how they are developed and the applications are also considered. The relations between the results of laboratory investigations and the requirements in the materials specifications are shown.

Materials

PROPERTIES AND MOLECULAR WEIGHTS OF SOME SILICONE POLYMERS. E. G. Rochow and T. G. Rochow. J. Physical & Colloid Chem. *55*, 9-16 (Jan. 1951). Relations between the properties and molecular weight of silicone polymers are discussed. Differences between silicone and organic polymers are also considered.

P. V. C. RIGID SANDWICH BOARD. E. E. Halls, Plastics (London) *16*, 224-5 (Aug. 1951). A rigid polyvinyl chloride laminate is described, in which the surface and interior layers are of contrasting colors. It is used for making name plates, labels, instruction panels, warning notices, etc. Results of dimensional stability tests are reported which show that the material is good in this property up to 60° C.

ROSIN-MODIFIED PHENOLIC RESINS. P. O. Powers. Ind. Eng. Chem. *43*, 1770-4 (Aug. 1951). Rosin has proved to be an effective fluxing agent for phenol-formaldehyde condensates. Recent work shows that rosin consists of several hydroaromatic acids, some of which may not react with phenolic resins. Although direct proof has not yet been given, there is much evidence of chemical combination between the phenolic resin and the rosin acid. A chroman structure of the addition product is suggested. A certain amount of cross linking between the phenol-formaldehyde condensate and two or more molecules of rosin acid is required to achieve the high melting point of the resulting rosins. This melting point is also associated with the hardness and rapid drying of finishes containing these resins. Methods of preparing various types of phenolic resins are considered in this review, as are the properties of the commercial materials. Methods of incorporating these resins in various varnishes are outlined.

COMMERCIAL PRODUCTION OF POLYSTYRENE. N. N. T. Samaras and E. Perry. J. Applied Chem. *1*, 243-8 (June 1951). The commercial production of polystyrene is limited by engineering considerations of heat transfer rather than by rate of chemical reaction. Mass polymerization has been developed for batchwise and continuous operation. Suspension polymerization was developed to overcome the limitations of the mass process by reducing the heat-transfer distances to small values and by keeping the reacting mixture at a low viscosity. Emulsion polymerization can be considered an extreme case of suspension polymerization in which the droplet size is less than 1μ. A consideration of relative capital and conversion costs shows that there are not large differences between the three processes, and the final choice as to which plant to install is a matter of specific circumstances. Future developments on commercial polystyrene operation will be directed toward reducing capital costs.

HALOGENATED ALLYL DERIVATIVES. G. B. Butler and F. L. Ingley. J. Am. Chem. Soc. *73*, 895-6 (Mar. 1951). In order to compare the physical properties and ion-exchange capacities of typical polymers prepared by polymerization of unsaturated halogenated quaternary ammonium salts with a typical non-halogenated polymer, several polymers of this type were prepared. As intermediates for these polymers several new unsaturated halogenated tertiary amines and quaternary ammonium salts were prepared and characterized. Polymerization of these salts resulted in the formation of water soluble polymers from those compounds containing only two unsaturated groups, and water insoluble polymers from those compounds containing more than two unsaturated groups. Comparison of the properties of typical members of the two types of polymers showed that the halogenated polymer has a higher coefficient of swelling and a higher ion-exchange capacity per unit weight than the non-halogenated polymer.

Applications

DISSOLVING PACKAGE. Modern Packaging *24*, 88-9 (Aug. 1951). Paint pigments are sold in a package made of plastic film which dissolves in the paint when the package is added to the material in the can. Desired colors can be accurately and readily mixed at will by the consumer.

UTILITY EXTRAS. Modern Packaging *24*, 75-7 (Aug. 1951). Refillable polyethylene spray containers are described.

MECHANIZED SQUEEZE-BOTTLING. Modern Packaging *24*, 68-70, 178 (Aug. 1951). Machines and techniques for filling and assembling polyethylene spray containers are described.

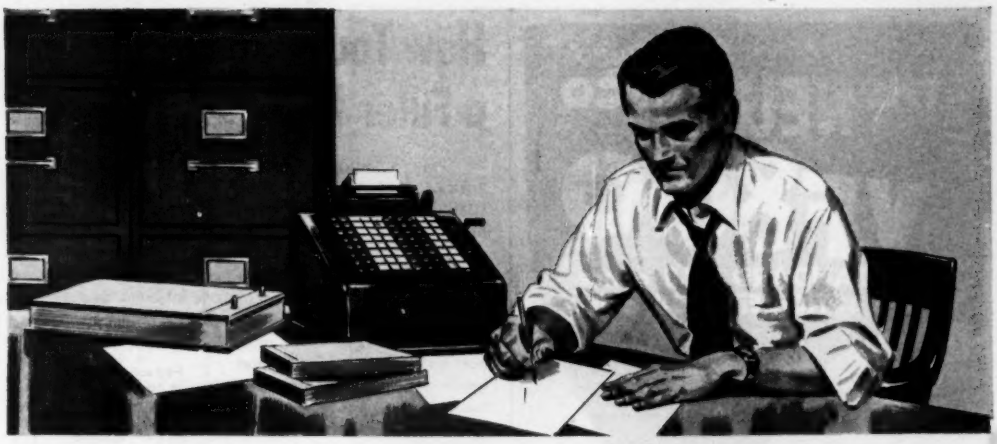
PLASTICS IMPROVE MINER'S LAMP. Brit. Plastics *24*, 2-4 (Jan. 1951). A miner's battery case and separators are molded of polyethylene.

POLYETHYLENE BALLOONS IN HIGH-ALTITUDE RESEARCH. Brit. Plastics *24*, 5-8 (Jan. 1951). High altitude balloons are fabricated from polyethylene film.

DEVELOPMENTS IN TELEPHONE CABLES. Plastics (London) *16*, 232-3 (Aug. 1951). Danish telephone equipment and cable made of polyethylene are described.

RIGID THERMOPLASTICS FOR CHEMI-

* Reg. U. S. Pat. Office.



manufacturing rock wool insulation?

figures prove

No. 328 PLYOPHEN

cuts costs...saves money

Costs go down, savings go up when you use RCI's No. 328 Plyophen as a binder in the manufacture of rock wool insulation. Besides the immediate savings realized on initial cost, No. 328 reduces stack losses to a minimum, enabling you to obtain a high quality end product with up to 10% less resin. Moreover, this top grade water-soluble phenolic resin is manufactured to exact standards of uniformity with the finest equipment available in the world today. To find how this resin can go to work for you, write the RCI Sales Department in Detroit. Complete information and a working sample will be sent on request.

REICHHOLD CHEMICALS, INC.

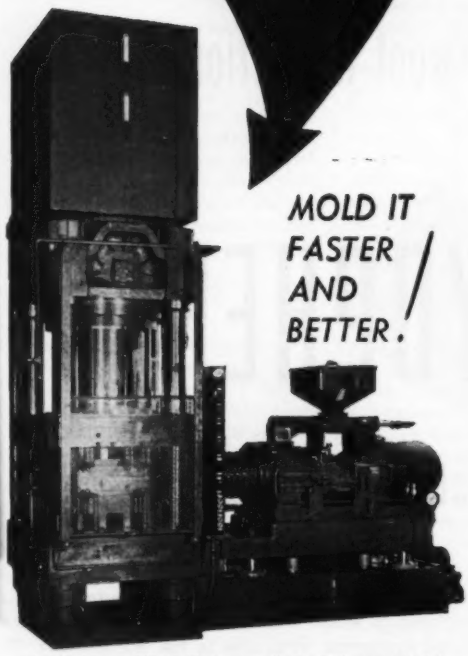
General Offices and Main Plant, Detroit 20, Michigan

Other Plants: Brooklyn, New York
Elizabeth, New Jersey • South San Francisco and Azusa, California • Tuscaloosa, Alabama • Seattle, Washington • Chicago, Illinois • Charlotte, N. C.
Liverpool, England • Paris, France • Sydney, Australia • Sassenheim and Apeldoorn, Holland • Naples, Italy • Buenos Aires, Argentina • Hamburg, Germany
Toronto and Port Moody, Canada • East London, South Africa • Osaka, Japan • Werndorf, Austria • Gothenburg, Sweden • Zurich, Switzerland

SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • PHENOL • GLYCERINE
PHTHALIC ANHYDRIDE • MALEIC ANHYDRIDE • SODIUM SULFATE • SODIUM SULFITE

THE NEW IMPCO VF800

STANDARD — 48 ounce
PREPLASTICIZER — 150 ounce



MOLD IT FASTER AND BETTER.

For better molding! Higher production! Fewer rejects! Turn to the new Impco VF800 Injection Molding Machine . . . it's fast . . . it's efficient . . . it's versatile . . . featuring vertical 800 ton clamp — a 24 inch clamp-stroke (adjustable) — 48 ounce standard injector or 150 ounce preplasticizer injector.

Write for information.

PLASTIC MOLDING MACHINERY DIVISION

Improved

PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE

How Tough can a Filler be?

PLENTY TOUGH—if SOLKA-FLOC is the filler. In fact, SOLKA-FLOC fibres are so tough that they enable production of plastics with almost *twice the strength* obtainable with wood flour!

Improved impact strength, greater electrical strength, more heat stability, lighter color and better wear are other properties your plastics can frequently obtain when SOLKA-FLOC is used.

Find out more about the use of SOLKA-FLOC in plastics. Write for information and samples to Dept. MP-11 Brown Company, 150 Causeway Street, Boston 14, Mass.

SOLKA®-FLOC

A PRODUCT OF QUALITY BROWN *Company*

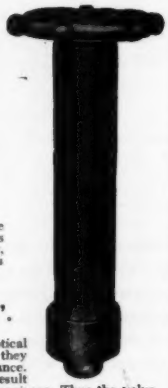
Berlin, NEW HAMPSHIRE

GENERAL SALES OFFICES: 150 CAUSEWAY STREET, BOSTON 14, MASS.

Branch Sales Offices:
Portland, Me., New York, Chicago, St. Louis, San Francisco, Montreal

SOLKA & CELLATE PULPS . SOLKA-FLOC . NIBROC PAPERS . NIBROC TOWELS . NIBROC KOWTOWLS . BERMICO SEWER PIPE, CONDUIT & CORES . ONCO INSOLES . CHEMICALS

IT'S MOST IMPORTANT TO KNOW THAT



when you are having high pressure reducing valve trouble, or when you are in need of a truly high pressure reducing valve, the thing to do is to specify the

ATLAS Type "E"

High Pressure Reducing Valve

shown at the right. Easily, and without the slightest shock, this valve reduces pressures as high as 6,000 lb. per sq. in.—air, water, or oil. It is an ideal valve for service of this kind in plastics plants.

Many "Doubting Thomases".

Many a plastics executive has been skeptical concerning Type "E," but after installing they have become enthusiastic about its performance. Why is this? Because Type "E" is the result of over a half century of regulating valve experience. Thus the valve body is made of the strongest forged steel. The main valve and the seat ring, subject to severest abrasion and corrosion, are Stellited. Other internal parts are of hard chromium plated stainless steel. A formed packing of special material superior to leather is used which is immune to all fluids commonly used in hydraulic machinery. The pressure on the seat is balanced by a piston with the result that variations in high initial pressure have little effect on the reduced pressure.

Ask for complete data.

For other ATLAS plastics plant products see the partial list in our ad in the January 1951 issue of MODERN PLASTICS

ATLAS VALVE COMPANY

REGULATING VALVES FOR EVERY SERVICE

277 South Street, Newark 5, N. J.

Represented in Principal Cities

CAL PLANT. K. Krekeler. Plastics (London) *16*, 226-8 (Aug. 1951). Piping, tanks, separators, and other chemical plant equipment are made of rigid polyvinyl chloride to obtain corrosion resistance.

PLASTICS FOR RAILWAY SIGNALLING EQUIPMENT. Plastics (London) *16*, 221-3 (Aug. 1951). An English railway signal station is described in which nylon, vinyl chloride, cellulose acetate, acrylic, phenolic, paper laminate, and wood laminate plastics are used for construction of some of the equipment.

Molding and Fabricating

SOME FLOW PHENOMENA IN THE INJECTION MOLDING OF POLYSTYRENE. R. S. Spencer and G. D. Gilmore. J. Colloid Sci. *6*, 118-32 (Apr. 1951). The steps in an injection molding cycle comprise dead time, filling, packing, discharge sealing, sealed cooling, and mold open time. Those steps involving polymer flow are discussed. The filling time is directly proportional to the polymer melt viscosity, and inversely proportional to a power of the ram pressure. Raising the mold wall temperature lowers the filling time. Reducing friction between the solid polymer and metal lowers the filling time, but only if the cylinder ahead of the heating chamber is cool. Studies with a glass-window mold show that hot polymer flows only in a central region, there being stationary layers next to the mold walls. When flowing polymer reaches the advancing front, it contacts the mold wall, cools, and ceases flowing. In a typical case the thickness of the central region was 40% of the total thickness. An approximate equation is presented for calculating maximum pressure in the mold during packing. Agreement with experimental values is good. Approximate treatment of sealing by "freezing" in the gate leads to a linear relationship between temperature and pressure in the mold at the sealing point.

Properties

CREEP RATES OF ACRYLIC PLASTICS. J. Marin. Product Eng. *22*, 171, 173, 175 (July 1951). Detailed engineering data on creep rates of acrylic plastics are presented in graphic form.

BEARING STRENGTH OF LAMINATED PLASTICS. L. P. Frankel and C. W.

Want
Quality
Blackness
at
LOW
COST?
Try
Monarch-74
● MONARCH 74 is popular with manufacturers of all-priced plastics products, and for good reason.
● New Cabot equipment has improved the black's dispersion properties, which means that MONARCH 74 now gives increasingly jet blackness, easier and faster milling, and a smoother, glossier film. Yet the cost of MONARCH 74 remains low.
● MONARCH 74 is unique, for it's the only black that gives all these advantages at so little cost. Order MONARCH 74.
CABOT

the ROYLE SPIROD* EXTRUDER

A completely new and different concept of electrically heated extruder designed for plastics materials. . . . Higher operating temperatures. . . . Lower operating costs. . . . Radiant heated. . . . Zoned as required throughout cylinder and head. . . . Even and controlled cooling. Royle Spirod Extruders have been field-tested and their stamina proved. Check these features that assure trouble-free operation —positive results.

- Heavy steel members without flanges
- Spirally installed rod type heating elements provide faster and more even distribution of heat
- Radiant heat provides steadier temperatures
- Complete insulation reduces heat loss with substantial power savings
- High watt capacity heating elements provide faster heat at lower cost
- Long life heating elements provide high and sustained operating temperatures
- Separate heating zones controlled by proportioning instruments
- Simple installation should replacements become necessary

*Patent Applied For

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — REgent 2430

Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262

Akron, Ohio — J. C. Clinefelter — JEfferson 3264

Los Angeles, Cal. — H. M. Royal, Inc. — LOgan 3261

PATERSON 3, NEW JERSEY

New!

VINYL CEMENT

- **Water-White**
- **Quick-drying**
- **One-surface application**

Developed after 2 years of research, "VINYL CEMENT" is a new and highly efficient solvent-type bonding agent for both flexible and rigid vinyl plastics.

SEND FOR DATA SHEET TODAY

Schwartz CHEMICAL CO., INC.

328 West 70th St. New York 23, N. Y.

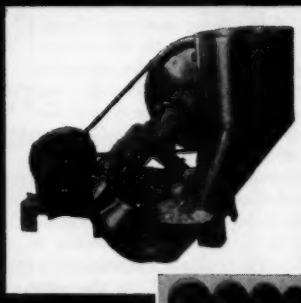
Buttondex

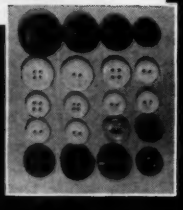
AUTOMATIC BUTTON FINISHER!

saves time!

saves space!

cuts costs!





This compact automatic machine punches, trims and cleans holes of Urea, Phenol and Melamine buttons.

- CAN BE SET AND RESET TO HANDLE ALL SIZES
- PRODUCTION UP TO 450 PER MINUTE
- COMES IN 3 SIZES

MODEL S ACCEPTS SIZES 12 to 34
MODEL SP ACCEPTS SIZES 36 to 60
MODEL SX ACCEPTS SIZES 12 to 60

WRITE TODAY for full details!

ButtOndeX CORP.

"Your Problem is Our Product" — 386 Fourth Ave. New York, N.Y.

Radcliffe. ASTM Bull. No. 175, 71-5 (July 1951). A comparison is made between conventional continuous load tests for the determination of the pin bearing strength of laminated plastic materials, and a test using the repeated load-permanent set technique. It is believed that the repeated load-permanent set test gives 1) a less arbitrary indication of the yield strength of the material in pin bearing, 2) the amount of permanent set or free play to be expected in a pin joint after release from a short-time load, and 3) the stress at which the permanent set would tend to become excessive. Data are presented on the results of tests with 12 resin-filler combinations by both continuous and repeated load methods.

BULK FACTOR AND APPARENT DENSITY OF GRANULAR POLYMERS. J. L. Williams and W. W. Grinnell. ASTM Bull. No. 175, 75-8 (July 1951). Two ASTM methods for measuring apparent density are compared with a modified procedure and an apparatus that has a somewhat higher degree of accuracy. This modified method is a means for controlling almost all of the variables usually encountered and eliminates all calculation. Typical values obtained with the various types of apparatus are shown and compared. Since all of these methods are empirical, the actual value will be somewhat dependent upon the conditions chosen. The conditions selected were based on comparison with values calculated from filling of commercial shipping containers.

MOISTURE PERMEABILITY, DIFFUSION, AND SORPTION IN ORGANIC FILM-FORMING MATERIALS. A. M. Thomas. J. Applied Chem. *1*, 141-58 (Apr. 1951). Experimental results which were obtained in the course of comprehensive investigations of the water-vapor permeability, diffusion, and sorption of organic film-forming materials are summarized. These data are used for elucidating the mechanisms and inter-relationships of the processes. The analysis is based on thermodynamic principles and the multimolecular theory of adsorption. It is shown that the moisture sorption/relative humidity curves agree with the B. E. T. (Brunauer, Emmett, and Teller) adsorption equation up to about 90% R. H. The heat of sorption is found to be the same as the heat of liquefaction

The appearance of METAL

at the cost of PLASTICS

Through the use of the Metaplast Process, we can provide your plastic pieces with gleaming metallic finishes. The attractive effects which can be achieved cost surprisingly little.

We metalize on plastics, metal and glass by all methods of coating.

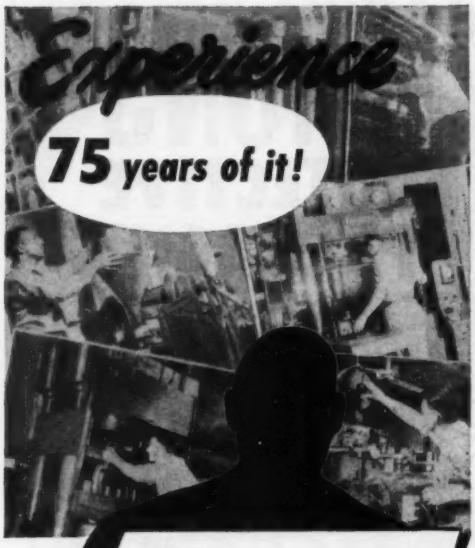
Consult Metaplast for assistance with your problems. We'll show you how to get best results at lowest cost and how to adapt your product for our metalizing process.

The Metaplast Process is adapted for industrial uses in the electronics field.

Factory and Office
9-17 37th Avenue, Long Island City 1, N. Y.

Laboratory
205 West 19th Street, New York 11, N. Y.

Metaplast
PROCESS, Inc.
PIONEERS OF MASS-PRODUCED METALIZING



our
Priceless Ingredient
in MOLDED
PLASTICS

Webster defines EXPERIENCE as "Knowledge or special skill resulting from one's continuance in a study or work." We like that definition. It sums up the best we have to offer American Industry. Because good and bad alike, *all* of our experience has contributed to our ever increasing knowledge in the molded plastics field.

What does this experience mean to you as a buyer of molded plastics? It is your assurance that the final design is sound . . . that the mold is engineered and built by experts . . . that the molding is done by the best methods and equipment. AUBURN molds all plastic materials and is completely unbiased as to type or method. Finally, it marks AUBURN as a reliable subcontractor.

Sales Engineers

Auburn salesmen are Sales Engineers—not agents—available for consultation with your design engineers. Or, if your design is complete, send us prints for quotations—without obligation.

Auburn Button Works, Inc.
AUBURN, NEW YORK
Founded in 1876 Telephone 3-5320

Miccrosol

A superior Vinyl Plastisol developed and manufactured to your specifications by MICHIGAN CHROME & CHEMICAL COMPANY.

MICCROSOL is specially formulated for a wide variety of coating applications as molding, dipping, etc. It is ideal for slush molding of toys and other suitable flexible objects; as well as a coating material for gloves, fabric, wire goods and packaging protection.

Our engineers will be glad to help you with your molding or coating applications. Write for consultation on your problem.

MICHIGAN CHROME & CHEMICAL COMPANY
6342 East Jefferson Avenue
Detroit 7, Michigan
MICCRO Industries

SCRAP AND VIRGIN
Plastics
CUSTOM GRINDING
PROCESSING
CLEANING
GRADING

A. Schulman Inc.
SCRAP and VIRGIN
Plastics

AKRON, OHIO 790 E. Tallmadge HEmlock 4124
NEW YORK CITY 500 Fifth Ave. LOngacre 4-5960
BOSTON, MASS. 738 Statler Bldg. Liberty 2-2717
E. ST. LOUIS, ILL. 14th & Converse BRidge 5326

of free water. It is concluded that the moisture sorption is a result of hydrogen-bond formation with hydrophilic radicals in the molecules of the solid plus van der Waals' forces.

TRANSITION TEMPERATURES OF PLASTICIZED MATERIAL AND COPOLYMER SYSTEMS. L. E. Nielsen, R. E. Pollard, and E. McIntyre. J. Polymer Sci. *6*, 661-4 (May 1951). The transition temperature, defined as the temperature where the log modulus-temperature curve has an inflection point, is a linear function of the volume fraction of compatible plasticizer added to a high polymeric resin such as polyvinyl chloride. The transition temperature of plasticized compositions can be predicted from the transition temperatures of the pure polymer and plasticizer. The transition temperature of homogeneous copolymers can be predicted from the transition temperature of the individual polymerized monomers making up the copolymer. Data are presented on three copolymer systems containing vinyl chloride and on various plasticized materials.

DIELECTRIC CONSTANT OF POLYSTYRENE SOLUTIONS. P. Debye and F. Bueche. J. Physical & Colloid Chem. *55*, 235-8 (Feb. 1951). No discontinuity exists in the dielectric constant versus concentration curve for polystyrene in toluene. The dielectric constant varies linearly with concentration in such a way as to extrapolate to the dielectric constant of the solid polymer. Impurities and the influence of handling of the samples are shown to lead to experimental results which, if not interpreted carefully, might suggest the existence of a break in the curve.

Testing

APPLICATION OF THE SPECIFIC GRAVITY GRADIENT COLUMN TO THE QUANTITATIVE DETERMINATION OF ADDITIVES IN A BASE MATERIAL. C. R. Stock and E. R. Scofield. ASTM Bull. No. 175, 78-81 (July 1951). The requirements for, and limitations of a method of quantitative estimation of additives in a base material, measured by differences in density, are set forth. The specific gravity gradient column of Linderström-Lang is described and discussed in terms of its range, sensitivity, stability, and calibration. The bearing which these factors have on the method is illustrated by an example in which the

Write for literature describing:
1. Heavy Duty Engravograph (illustrated) Catalog H 20
2. Portable Engravograph Catalog IM 20

NEW HERMES, Inc. 13-19 University Place New York 3, N.Y.
World's Largest Manufacturer of Portable Engraving Machines

We're Pioneers in Custom Injection Molding!

Sinko, with many years of practical experience in this field, is admirably qualified to produce all your moldings from 4 to 60 oz. A staff of highly skilled specialists, using the latest in modern equipment, will manufacture your injection molded parts and products with the utmost in accuracy, speed, and economy.

We mold all thermo-plastic materials including Nylon, which has been a Sinko specialty since its introduction to the molding industry.

Engineering

Our complete engineering facilities are at your disposal. Engineers with a great deal of experience and know-how in every phase of molding are here to help design your products and supervise their manufacture.

Molds and Molding

We're exceptionally well equipped to build your molds, in all sizes, here at Sinko; and to maintain them at peak performance. So you can be sure that your orders for molded parts will reach you promptly and on schedule.

Finishing

A complete finishing service . . . from the molding to the assembled product, ready for packaging. Metal-plastic assemblies, 2 and 3 color plastic spraying, and hot stamping are but a few of our many finishing services.

Sinko MANUFACTURING & TOOL CO. 3135 WEST GRAND AVENUE CHICAGO 22, ILLINOIS

INORGANIC PIGMENTS
for plastics

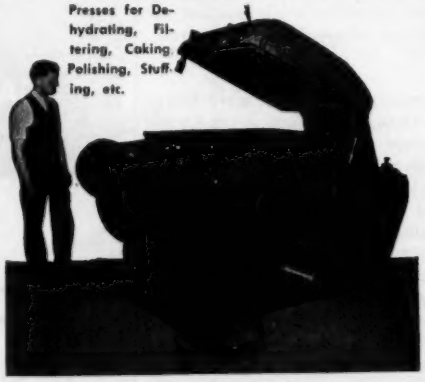
PERMANENT • DEPENDABLE
RESIST FADING AND HIGH TEMPERATURES
INSOLUBLE IN SOLVENTS and PLASTICIZERS

Suitable for
CASTING • INJECTION or COMPRESSION MOLDING • CALENDERED FILMS AND COATING PROCESSES

LET US KNOW THE APPLICATION

B. F. DRAKENFELD & CO., INC.
45-47 Park Place, New York 7, N. Y.
Drakenfeld

Complete Line of
Machinery for Celluloid and Plastics Mfrs.
JOHN J. CAVAGNARO
HARRISON ESTABLISHED 1881 Engineers and Machinists NEW JERSEY



Mixers: Plain or Stainless
Preliminary or Vacuum

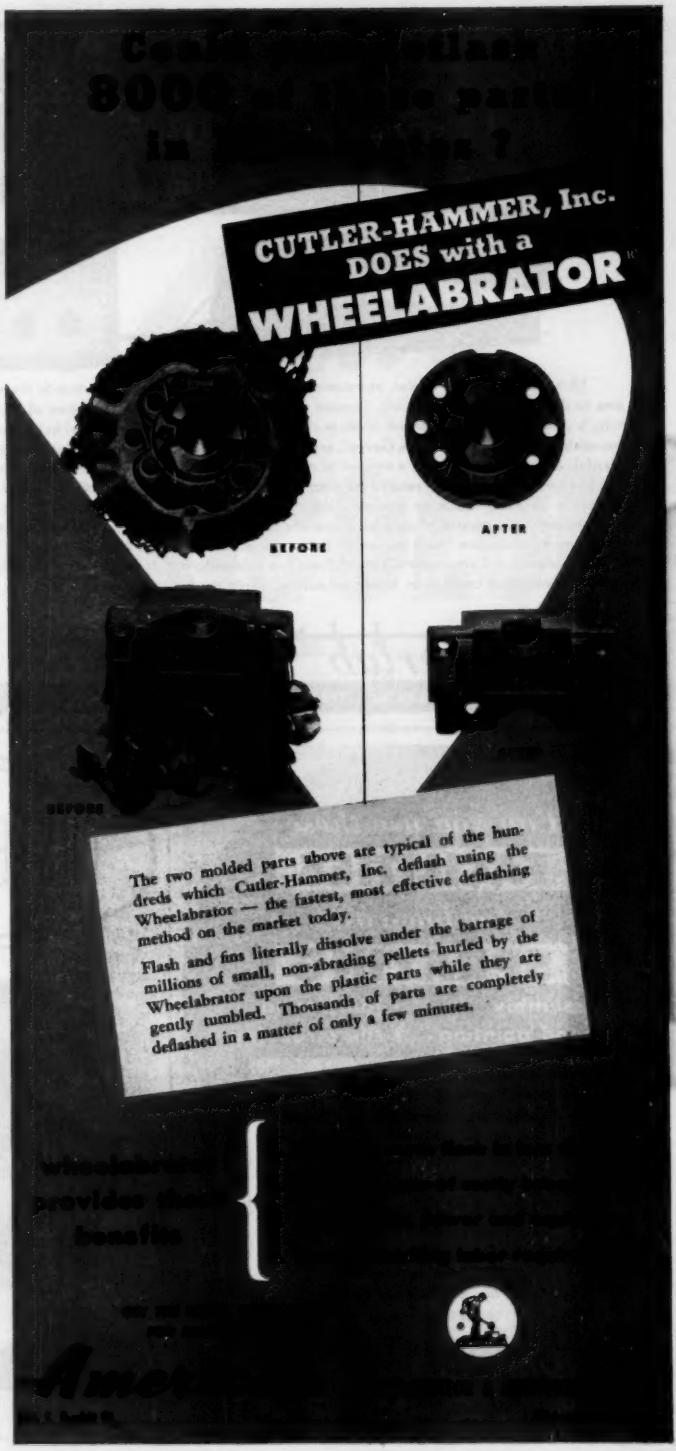
concentration of a melamine resin, applied to a wool flannel for control of shrinkage, is determined.

ELECTROLYTIC CORROSION TESTS IN PRESSURE - SENSITIVE ELECTRICAL TAPES. C. W. Bemmels, R. J. Priepke, and L. D. Fallon. Electrical Manuf. 47, 129-31, 248, 250, 252, 254 (Apr. 1951). Methods for determining the corrosion resistance of pressure-sensitive electrical tapes were investigated. The corrosion current method is preferred because 1) it is the most reproducible, 2) it gives the greatest dispersion values among samples, and 3) it gives the best correlation with another test method designed to simulate corrosiveness of the test material in contact with enameled wires.

RETRACTION TEST FOR SERVICEABILITY OF ELASTOMERS AT LOW TEMPERATURES. O. H. Smith, W. A. Hermonat, H. E. Haxo, and A. W. Meyer. Analytical Chem. 23, 322-7 (Feb. 1951). Elastomer vulcanizates progressively stiffen as the temperature is lowered. Additional stiffening, due to crystallization, may occur as exposure to low temperatures is prolonged. The available methods of testing the low temperature flexibility of rubber and rubberlike materials do not reveal the losses in flexibility caused by crystallization except by using prolonged storage at low temperatures. A retraction test employing large deformations, which greatly increases the rate of crystallization, was developed. This test rapidly gives a temperature index correlating with the stiffness of elastomer vulcanizates after storage at low temperatures, and can be used to measure the merit for low temperature applications of both crystallizable and noncrystallizable elastomers. This test in conjunction with conventional (room temperature) tests was used successfully to study the low temperature performance of Hevea, GR-S, Paracril, and polybutadiene vulcanizates along with vulcanizates of many experimental elastomers. Correlation of results with cold compression set and hardness after low temperature storage was excellent and substantiates the usefulness of the test.

Chemistry

GR-S AGING IN SOLUTION. G. D. Jones and R. E. Friedrich. Ind. Eng. Chem. 43, 1600-4 (July 1951). The


CUTLER-HAMMER, Inc.
DOES with a
WHEELABRATOR®
BEFORE
AFTER
The two molded parts above are typical of the hundreds which Cutler-Hammer, Inc. deflash using the Wheelabrator — the fastest, most effective deflashing method on the market today.
Flash and fins literally dissolve under the barrage of millions of small, non-abrading pellets hurled by the Wheelabrator upon the plastic parts while they are gently tumbled. Thousands of parts are completely deflashed in a matter of only a few minutes.

THICKNESS CONTROL A PROBLEM?

Tracerlab Beta Gauges

CUT COSTS—IMPROVE QUALITY

TRACERLAB's new model, non-contacting Beta Gauge measures and records the weight per unit area or thickness of sheet materials. Because beta radiation is used, a high degree of accuracy and sensitivity is achieved, unaffected by variations in chemical compositions of the material being gauged.

Tracerlab developed the first Beta Gauges, and the experience gained through having these instruments in successful, everyday operation in a number of diversified process industries has now been incorporated in a new and outstanding gauge. Featured are simplicity of operation, ruggedness of design and reliability of operation — all combined in an instrument that maintains Tracerlab's established leadership.

For non-contacting gauging of materials accessible only from one side, Tracerlab manufactures a model which operates by measuring "back scattered" beta particles. This gauge is particularly useful in gauging rubber, paper, plastics and other materials as they pass over a calender roll. It has also proved highly effective in measuring thickness of coatings on certain substances. *Write for Bulletin BG-M.*

Tracerlab
BETA GAUGES
are NOW gauging:

Cardboard • Plastics
Paper • Adhesive tape
Sheet metal • Metal foil
Paper coatings • Rubber
Plastic coatings
Photographic coatings
Linoleum

Tracerlab

SALES OFFICES:
BERKELEY, CAL., CHICAGO, ILL.
NEW YORK, N. Y.
WASHINGTON, D. C.

TRACERLAB INC., 130 HIGH STREET, BOSTON 10, MASS.

Can you use these
FACILITIES
for low-cost
SPRAYING

• assembly • fabricating
• hand painting • silk screening

Make use of the finest assembly facilities available in the East...and save money by doing so. Let Nordan package and drop ship for you... build your models...help develop your products.

17 fully equipped spray booths
13 conveyor belts
40 airbrush and paint specialists
special department for making electro formed spray masks
facilities for defense work

For any plastics assembly job, contact Nordan now

NORDAN PLASTICS CORP.
397 Bridge Street • 26 Front Street
Brooklyn 1, New York

FASTER PACKAGING

with the Anderson Portable Bagger

It's easy to bag products with this smooth operating machine. Simple adjustments for height . . . tilts forward or backward to give the most comfortable operating position. Stainless steel trough holds 200 bags . . . adjustable to bag sizes. Blower with air filter opens bags and keeps them free from foreign matter. Reasonably priced . . . get the facts.

Anderson BROS. MFG. CO. ROCKFORD, ILLINOIS

Send for
Bulletin No. 11-31

ANDERSON BROS. MFG. CO.
ROCKFORD, ILLINOIS

degradation and oxygen absorption of solutions of GR-S were studied in an effort to explain the failure of antioxidants under ultra-violet light. The photodegradation of GR-S in solution occurs only if oxygen is present. Two types of peroxides can be formed: a stable peroxide at elevated temperatures and a labile one, which may be polymeric, at room temperature. These peroxides can be differentiated by the use of aliphatic amines which cleave the latter and produce thereby a viscosity decrease. Aliphatic amines are good antioxidants for GR-S at 90° C. but poor antioxidants under ultra-violet light.

COPOLYMERIZATION. H. W. Melville, E. P. Bonsall, and L. Valentine. J. Applied Chem. *1*, 249-53 (June 1951.) The mechanism of the copolymerization of two components in addition-polymerization is examined in detail for the systems styrene-methyl methacrylate, styrene-butyl acrylate, and styrene-p-methoxystyrene. In such reactions, nine elementary-radical processes are involved. By kinetic analysis of the problem combined with measurements of the rate, composition, and molecular weight of the copolymers and measurements of the rate-coefficients for the polymerization of individual components, all the nine rate-coefficients may be determined with reasonable accuracy. One of the unusual factors which comes out of this study is that in the reaction of methyl methacrylate and butyl acrylate the velocity with which dissimilar radicals interact with each other is very much greater than the geometric mean reactivity of the separate radicals. On the other hand with the p-methoxystyrene system completely normal behavior is obtained and the rate of the interaction of dissimilar radicals is exactly equal to the geometric mean of the reactivity of the separate radicals.

X-RAY INVESTIGATION OF 2:2'-DIHYDROXY-5:5'-DIMETHYLDIPHENYLMETHANE AND ITS 3-, 4-, AND 5-RING POLYMERS AND p-CRESOL NOVOLAK RESINS. R. F. Hunter and V. Vand. J. Applied Chem. *1*, 298-300 (July 1951). The X-ray diffraction of 2:2'-dihydroxy-5:5'-dimethyldiphenylmethane and its 3-, 4-, and 5-ring polymers, two p-cresol-formaldehyde resins of known average molecular weight, and the 1:1-addition complex of the 4-ring polymer and

Cut Color Costs!

with

UNICOLOR

Saves as much as 5½¢ per pound!

Prevents inventory losses and costs!

Eliminates production delays!

Increases molding equipment capacity!

UNICOLOR, the revolutionary resin color concentrates, comes in granulated or pellet form. *No special mixing equipment is required* — Any operator without special extrusion training can mix UNICOLOR. Color and molding is simultaneous. They form a molecular bond by fusing and thoroughly distribute a uniform color throughout the thermoplastic.

You only prepare the quantity in proper proportion for the specific job. Thus, UNICOLOR, in one step, saves money, prevents inventory loss, eliminates production delays and increases molding capacity.

UNICOLOR does not affect the physical or chemical properties of the plastic, nor does it interfere with normal extrusion rates.

UNICOLOR does *not* produce blemishes, blisters, mottling, streaking, or bleeding. It does not fly—will not contaminate other machines. No more clogged screens with UNICOLOR.

A wide range of popular and approved NEMA colors are available. Special colors are scientifically matched.

We are custom compounders and can handle special problems.

Write now for informative folder on how to cut costs with UNICOLOR.

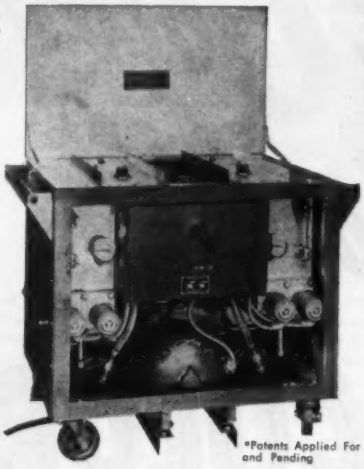
WESTCHESTER PLASTICS

WESTCHESTER PLASTICS, INC.
MAMARONECK, N. Y.

A constantly mounting weight of evidence is proving that

THERMOLATOR*
MOLD TEMPERATURE CONTROL

- *Improves Quality of Product*
- *Accelerates the Casting Cycle*



*Patents Applied For and Pending

Because of its design and special features (on which Patents are Applied For & Pending), THERMOLATOR will help in quickly establishing ideal mold temperature, then will hold that temperature within 2° F., thus eliminating scrap caused by Bubbles, Silver Streaks, Poor Surface Finish, Crazing, Blisters, Dimensional Variations etc., while permitting a healthy increase in production rate.

Leading Injection Molders all over the United States are using THERMOLATORS, in many cases 100%.

FIND OUT WHAT **THERMOLATOR** *CAN DO FOR YOU!*

REPRESENTATIVES:

F. W. Jennison—Suite 603, 570 7th Ave., New York 18, N.Y. Pacific Scientific Co.—1430 Grande Vista Ave., Los Angeles 23, Calif. FOR CANADA: Richardson Agencies, Ltd.—454 King St. West, Toronto 1. FOR EUROPE: Jacques Brijet & Co.—15 Park Row, New York 7, N.Y.

WRITE TO:

INDUSTRIAL MFG. CORP.
31 E. GEORGIA ST., INDIANAPOLIS 4, INDIANA

Compression molded thermoplastic sheet users now have available larger sizes of Acadia polystyrene. These are available in the new size of 36" x 36" x ⅛".

Standard sizes are furnished in 20" x 20" from ⅛" to 1" thick and 24" x 24" from ⅛" to ½" thick. Special sizes are also available. Polystyrene, Tenite, Koroseal, Vinylite, Geon, Ethyl-Cellulose and Styralloy sheets can be compression molded in most of the above sizes.

Write or write for specifications.

Acadia Synthetic Products Division
WESTERN FELT WORKS
4035-4117 Ogden Ave. • Chicago 23, Ill.

ACADIA
Processors of Synthetic Rubber and Plastics • Sheets Extrusions • Molded Parts
Synthetic **PRODUCTS**

MANUFACTURERS AND CUTTERS OF WOOL FELTS

FORM GRINDING **of cylindrical parts from non metallic materials is our specialty. Our range of size is from ⅛ to ¾ diameter and up to 7" long. We can hold tolerances of ±.002 on plastic and ±.005 on wood.**

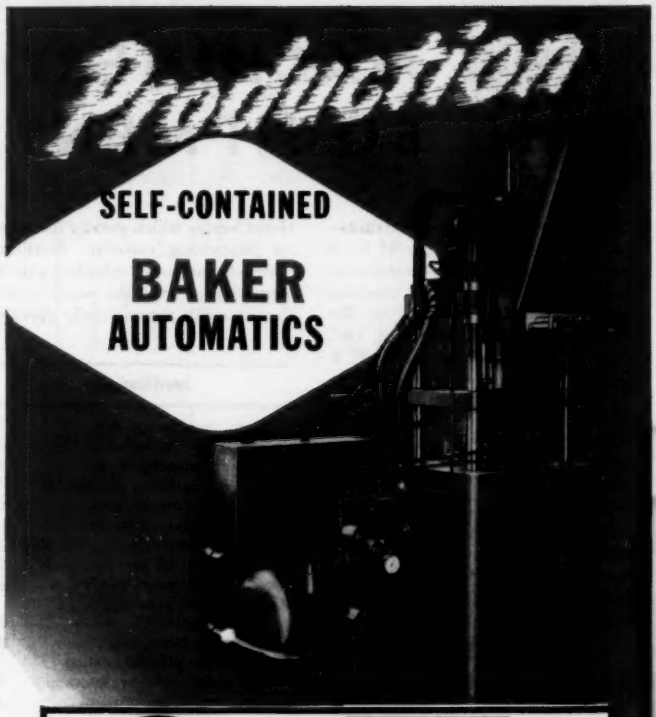
- **If you make such parts or are planning a change from aluminum, brass or steel screw machine parts we can increase your production capacity. Send a print or sample for quotation.**

ORANGE PRODUCTS, INC. FORM GRINDING SPECIALISTS

ethylene dichloride were examined using a Frevel focusing camera of high resolving-power. Each pattern of a crystalline individual, however, proved different from the others, and the number of repeating units in the polymer chain of the *p*-cresol series is insufficient to lead to regularities of the type observed in other homologous series. There is a definite change from the crystalline to the amorphous state on passing from the 4-ring to the 5-ring polymer, and the latter gives a photograph showing that the compound is approaching the condition of *p*-cresol-formaldehyde resins. No polymorphism was observed in specimens of 2:2′-dihydroxy-5:5′-dimethyldiphenylmethane prepared by crystallizing from different solvents and by drying under different conditions.

EMULSION POLYMERIZATION OF STYRENE. II. EFFECT OF AGITATION. S. R. Shunmukham, V. L. Hallenbeck, and R. L. Guile. J. Polymer Sci. *6*, 691-8 (June 1951). Employing a reproducible system for the emulsion polymerization of styrene, it is demonstrated that agitation (stirring or shaking) affects both the rate of polymerization and maximum average molecular weight of the polymer formed. Increasing the agitation increases the inhibition, decreases the polymerization rate, and lowers the average molecular weight of the polymer formed. Agitation affects both a peroxide and a persulfate catalyzed polymerization in a similar manner. Agitation effects are observed in the presence of a redox system and in the presence of a chain modifier. Oxygen is demonstrated to stop as well as inhibit the initiation of an emulsion polymerization.

CHEMISTRY OF PHENOLIC RESINS AND THE PROCESSES LEADING TO THEIR FORMATION. A. Zinke. J. Applied Chem. *1*, 257-66 (June 1951). This is a review of the work on phenolic resins done by Euler and his coworkers, by Hultzch, and by Zinke and his team, and of the importance of this work for the knowledge of the hardening process. More recent research work of Zinke and his coworkers, especially on cyclic polynuclear phenols is also described. There is a short discussion of the chemistry of novolaks and of the work of Ziegler. Results of research on the hexamine-hardening process are also discussed.



Rheostat for headlight switch terminal
(*Actual Size*)

840 PIECES PER HOUR

Using an 8 cavity mold on the Baker 15 ton automatic compression molding machine, cycle time is only 34 seconds for these rheostats for headlight switch terminals. This includes metering of charges, loading, cure time, ejection and flash cleanout.

Mr. Hugh Hall, general manager of Plastic Research Products, Urbana, Ohio says., "The new Alkyd rheostat replaces a ceramic part which has been a source of trouble due to breakage in assembly and failure in service. The part must withstand high heat, remain stable dimensionally and resist the stress of riveting. Parts can be turned out on our Baker automatic at the rate of 840 pieces-per-hour using an 8 cavity mold. The simplicity and ease of operation of the Baker automatic coupled with the use of fast curing Plaskon Alkyd powder have greatly increased the production rate for this part, thereby materially reducing production costs."

CLOSURE . . . 400 inches per minute with ALKYD

ALSO SLOW SPEED FOR PHENOLICS, UREAS, MELAMINES

Baker Brothers invite comparison of their closure speed of 400 inches per minute, their large platen area and overall Alkyd cycle time of 4 seconds plus cure, or the phenolic cycle time of 12 seconds plus cure with any other machine on the market. Actual records of specific parts show the Baker Automatic to be capable of multiplying production by as much as four times, and with lower initial investment due to the fewer die cavities required. The machine is available from stock in both 15 ton and 30 ton models with 8 cavity feeder. Floor area 56″ x 25″ for either model. Send for details . . . now!

BAKER BROS., Inc., Toledo, Ohio
PROGRESS IN HEAVY MACHINERY . . . SINCE 1867

BAKER BROTHERS, INC.
TOLEDO, OHIO
Send more information on the Baker Fully Automatic Compression Molding machine to:

Name _____
Title _____
Company _____
Street _____
City _____ Zone _____ State _____

NEW MACHINERY AND EQUIPMENT

SIXTEEN-OZ. INJECTION MACHINE—Low center height of only 47 in. is one of the principal new features of a 16-oz. injection molding machine recently added to its line by The Projectile and Engineering Co., Ltd., Acre St., Battersea, London S.W. 8, England, which also produces 2-, 4-, 6-, and 8-oz. machines. This height advantage, combined with a retractable tie-bar arrangement, is said to facilitate greatly the setting up of molds.

Mold-locking is carried out by a fully balanced, quick acting toggle in which the pins are designed for long life and minimum wear. Mold space is adjusted by a central screw to provide equal load distribution over the platen area.

The hopper feed mechanism is of the cylindrical, self-compensating type, designed for easy adjustment. It is operated by the main injection ram through a spring, which takes up any excess load should the feed mechanism become jammed. The material cylinder is completely streamlined, thus eliminating blind spots which might trap and burn material and cause discoloration. Two independent electric pyrometers control the band-type heaters on the injection cylinder. In addition to the external heater bands, the injection cylinder is fitted with an internal heater which greatly increases its plasticizing capacity. Auxiliary hydraulic push-off cylinders can be controlled so that the whole injection unit will automatically move at the end of each shot to break the sprue; alternatively, the nozzle can be kept in contact with the sprue bushing if desired.

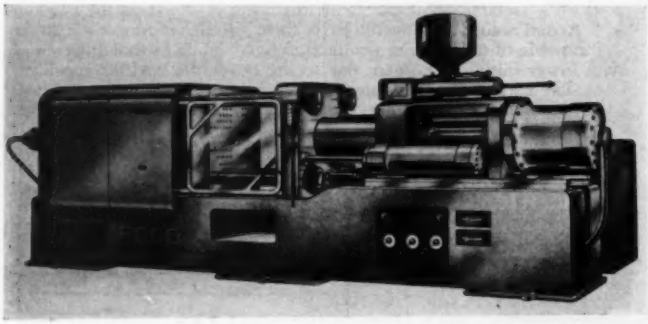
Specifications

Cubic in. molded per shot	22
Oz. molded per shot	16
Plasticizing capacity lb./hr.	85
Diameter of injection plunger, in.	3½
Pressure on material, p.s.i.	20,000
Rate of injection, cu. in./sec.	21.6
Size of platens	35½ x 35
Space between tie bars	20½ x 21
Maximum die space, in.	25
Max. projected area of molding, sq. in.	135
Mold locking force, tons	400
Power consumption of heating units at full capacity, kw.(app.)	15
Motor required, hp.	40

Two sets of hydraulic pumps are used. One set is in operation only during the mold closing stroke, while both pumps make available a capacity of nearly 30,000 cubic in. per minute to insure fast injection.

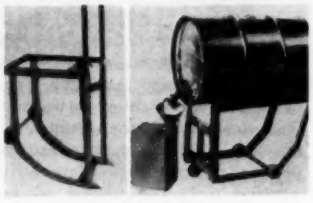
The main hydraulic valves are controlled by solenoid operated pilot valves, and separate control valves are provided for varying the speed of injection and mold closing, and the hydraulic pressure on the injection cylinder.

Center height of 47 in. and retractable tie-bar are features of 16-oz. injection machine



UNIVERSAL VISE—Round, tapered, or irregular objects can be instantly clamped by only a slight turn of the tightening screw on a new universal screw vise, the Sevo, distributed by De Wilde-Jones, Inc., 181 Steuart St., San Francisco 5, Calif. Jaws of vise are a series of machined and ground flat Swedish steel plates which hinge or swivel in any desired direction to coordinate with the object held. Heavy torque is not required to grip the object tightly. Distance between jaws is 2½ in. for one model, 5 in. for another.

HANDLING CARRIER—An inexpensive, portable carrier, called the Handy Van, has been developed by Allied Dealers Supply Co., Monterey Park, Calif. It is said to permit movement of heavy drums and barrels with maximum safety and ease.

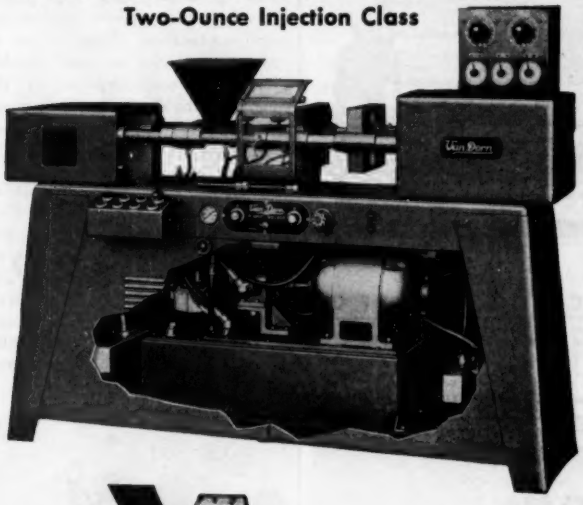


Constructed of ¼-in. angle iron and welded throughout for safety and durability, the van acts as both a hand truck and a dispensing rack. After lifting a drum or barrel (maximum capacity, 1000 lb.) and transporting it to the point of use, the carrier is tilted onto its back; it then becomes a waist-high storage rack. Handles telescope out of the way. The equipment comes with either rubber tires or metal wheels.

VALVE TO END SPOOL STICKING—A pilot-operated valve utilizing the system pressure to move the spool has been developed to overcome the problem of spool sticking often encountered with solenoid valves in high-pressure hydraulic circuits, especially when long machine dwell time is necessary. Solenoids are employed only to operate small internal

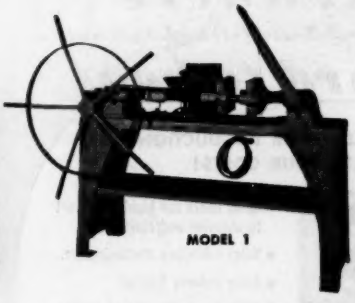
Produce Plastics Profitably With This
VAN DORN Equipment

Model H-200—Leader in the Semi-Automatic Two-Ounce Injection Class



This ultra-modern press molds practically all thermoplastics including nylon. It completes up to 6 operating cycles per minute. Push button controls are safe, simple and convenient. Compact and rugged, the unit is quiet and economical in operation. Sliding gate with interlocking safety devices starts the cycle. Solenoid valves close the molds. Injection and dwell are controlled by first of three timers on the rear panel. Center timer regulates recharging of heater. The third timer controls the length of the mold close cycle; when time runs out, molds automatically open and parts are ejected. Operator opens safety gate, removes product and then closes gate to begin the next cycle . . . Variable voltage transformers in conjunction with thermostatic units control the temperatures on the two heating zones accurately.

MODEL H-200



MODEL 1

MODEL G-100

Power Operated, Lever Controlled Presses

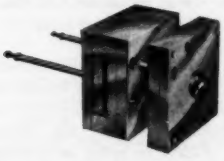
2-oz. or 1-oz. capacity. These low-cost units operate 8 hours for under a dollar and use inexpensive molds. Can easily be set up in twenty minutes by one man.

Manually Operated Press

1-oz. capacity. This press is ideal for smaller jobs, experimental work and technical training.

Plastic Grinder

Grinds up rejects, waste, etc., for re-use. Ruggedly made, designed for easy cleaning.



Mold Bases

Available from stock for all Van Dorn presses.

Write for Bulletins on this Equipment

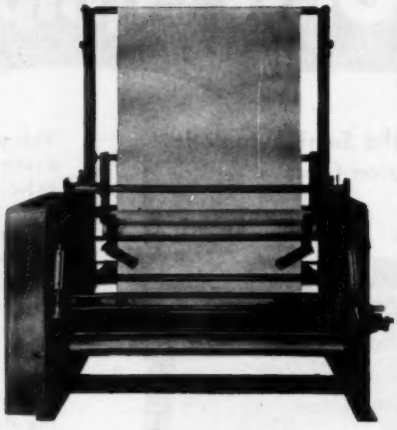
THE *Van Dorn* IRON WORKS CO.

2687 EAST 79th STREET • CLEVELAND 4, OHIO

Cable Address "VANDORN" Cleveland

FULLY AUTOMATIC BATCHING OF YOUR PLASTIC FILM

Just load the magazine of the Progressive Automatic Batcher with cardboard tubes and set the desired number of yards per tube on the controls. Then, without requiring additional attention, other than the replenishment of the tube supply, the Automatic Batcher will wind the proper yardage, cut off the film and start winding on a new tube!



Progressive machine co., inc.

Specialists in Plastic Film Handling Equipment

198-202 East 25th Street Paterson 4, N. J.

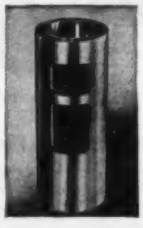
Tubing Machines • Continuous Hammers & Sealers • Film Cut-Off Reels

Extruders

find Xaloy-lined cylinders

hard to beat

INCREASE YOUR PRODUCTION!
DECREASE YOUR COSTS!



- Xaloy liners are highly resistant to abrasion and corrosion.
- Xaloy minimizes contamination.
- Xaloy reduces friction.
- Xaloy has uniformity of quality.

• SPECIFY XALOY LINERS TO YOUR SUPPLIERS

FOR CORROSION RESISTANCE

FOR ABRASION RESISTANCE

Xaloy

Xaloy 306

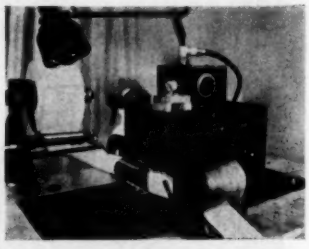
INDUSTRIAL RESEARCH LABORATORIES, LTD.
961 EAST SLAUSON AVENUE
LOS ANGELES 11, CALIFORNIA

WRITE FOR ENGINEERING AND PRODUCTION DATA BOOK!

pilot valves and, as a result of this arrangement, introduced by The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio, spool action is said to be smooth, quick, and positive under all conditions up to 5000 p.s.i. The valve is also designed so that the spool always moves at uniform speed regardless of pressure.

Valves are available in ¾- and 1½-in. sizes in both single- and double-solenoid types, with provisions for either external or internal pilot connections. Eight types of spools provide for an equal number of porting combinations. In the double-solenoid, the spool is automatically pressure-centered when the solenoids are de-energized.

ELECTRONIC TUBE SEALER—Almost any size tubing can be made from any thickness of sheeting on a special electronic heat sealing unit developed by Mayflower Electronic Devices, Inc., 6014 Hudson Blvd., West New York, N. J. In operation, a continuous strip fed into the machine from a roll of material is first formed

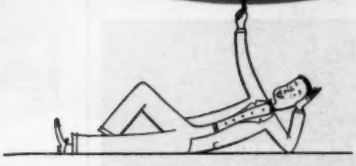


into tubing. The overlapped edges then go between a pair of rotary electrodes where the seam is sealed. The tube is then delivered by a pair of pull rollers, synchronized to the speed of the sealing rollers. Speed of operation can be varied to suit the rapidity with which the materials being sealed can take heat.

The 350-watt machine is provided with controls for increase and decrease in power, adjustment of speed, and amount of bonds per inch.

TAPPING MACHINE—Single spindle tapping units or multiple heads can be used on a new High-Speed-Sensitive tapping machine, the Ettco-Emrick #72A, recently announced by Ettco Tool Co., Inc., 594 Johnson Ave., Brooklyn 6, N. Y. Equipped

YOUR CUSTOM MOLDING HANDLED WITH EASE BY IDEAL WORLD'S LARGEST INJECTION MOLDER



Do you have to have vital parts for D.O.'s? Are production deadlines a problem? Must dimensions be on the button? Is there a hurry hurry call for hundreds or thousands of molded pieces?

If your answer to any of these questions is "yes", then you certainly need a custom molder like Ideal . . . a molder who has the know-how and sufficient facilities to take even the toughest assignment in stride.

Ideal's been in injection molding ever since it became big business, and has successfully completed literally thousands of jobs. And no one can match Ideal's facilities! Thanks to a recent $5,000,000 expansion, Ideal has nearly one hundred modern injection presses ranging up to three hundred ounce capacity. These presses are supplemented by two complete assembly and finishing departments.

Contracting for custom injection molding without examining Ideal's estimate isn't good business. Ideal can often save you time, trouble and needless expense. Write, A. C. Manovill, Vice Pres. in Charge of Sales. Ideal Plastics Corporation, 184-10 Jamaica Ave., Hollis 7, N. Y. Phone: AXtel 7-7000. Mid-West Representative, Steel Mill Products Co., 176 West Adams St., Chicago 3, Ill. Phone: CEntral 6-5136.

Better Molded Plastics — Ideal — *for Industry & Home*

SPLCORP
RIGID PLASTIC SHEETS

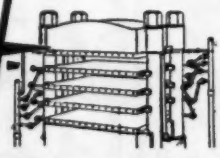
CORRUGATED or PRESS POLISHED

transparent, translucent or opaque
manufactured to your specifications

YOUR REQUIREMENTS for custom-manufactured thermoplastic sheets, either corrugated, press polished, embossed or laminated, can be met by Scranton Plastic Laminating Corp. We manufacture close tolerance Splcorp sheets from .005" to 2" thick, up to a maximum of 51" by 108". And high compression laminated sheets up to 50" wide and 72" long, of phenolic, silicone or esters.

Among the materials which we can incorporate in these sheets—both for the sake of appearance and for strength—are wood, Fiberglas, wire screen, metal foil, fabric and paper. Your inquiry will receive prompt attention.

displays
construction
decoration
lampshades
surfacing



SCRANTON PLASTIC LAMINATING CORP.
3218 PITTSTON AVENUE
SCRANTON 6, PENNSYLVANIA

DIEMOLDING CORPORATION
Canastota, N.Y.

TRADE DM MARK

A complete molding plant for thermosettings with an enviable record of performance established with many of the largest users of molded parts.

Call upon our engineers and designers for aid or advice in planning your molded parts.

Plastic Molders Since 1920

DIEMOLDING CORPORATION

with provisions for quick changeover from one production job to another, the equipment has a tapping action controlled through an adjustable pull spring inside the centerless ground column. When a treadle (operated by either foot or air pressure) is actuated, the spring feeds the tap to the work and gives automatic protection against breakage or faulty threads.

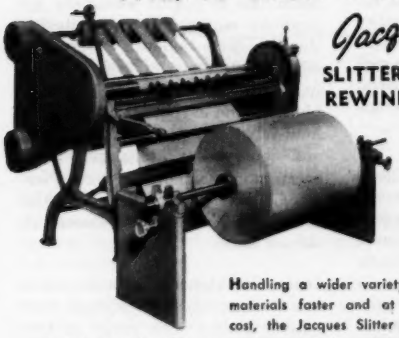
Two oil tanks are built in: one cast in the head and using gravity feed for light lubrication; the other in the base for use with an oil pump when steady oil flow is required. A built-in stripper plate permits the use of simple work holders, is used to strip part from tap, and also holds the lubrication tube and brush. Five sizes of tapping attachments and standardized multiple head systems with work holders are available.

ELEVATING CONVEYOR—Feeding material, such as plastics pellets, into injection or extrusion molding machines and adaptability to many packaging operations are some of the handling functions possible with the Robo-Lift elevating conveyor manufactured by Counsel Machine Co.,

Inc., 8 Hathaway St., Wallington, N. J. The complete unit comprises a supply hopper with feeding device, interlocking buckets mounted on a flexible steel chain, and a discharge chute. Material flows from the hopper to buckets whose edges overlap. The fact that material is fed into buckets instead of being scooped up is said to prevent damage or spilling. At point of discharge, buckets invert and deposit contents into the discharge chute either to the left or the right. The conveyor can be extended to any desired height by adding bucket units.

Only a COMPLETE Plant
can offer
a
COMPLETE
SERVICE
WE MANUFACTURE . . . Virgin Thermoplastic injection and extrusion molding compounds, standard and special formulations . . . Polystyrene, Polyethylene, Acetate, Butyrate, Ethyl Cellulose, Vinyls, Acrylics.
WE BUY . . . THERMOPLASTIC SCRAP—all types and forms: Polystyrene, Vinyls, Nylon, Ethyl Cellulose, Polyethylene, Acetate, Butyrate, Acrylics.
WE CUSTOM COMPOUND your materials, and offer these special services: Sorting, De-contaminating, Color-Matching, Pelletizing.
WE EXTRUDE . . . any flexible or rigid formulation which you plan, for any special-shaped Belting, Binding, Edging, Rods, Tubes, Film, Strips . . . in Polystyrene, Cellulose Acetate, Polyethylene, Vinyl, Butyrate, Ethyl Cellulose, Acrylics.
DRYCOL—offered as Gering's perfected dry coloring medium for in-plant coloring of ALL PLASTICS. No special skill or equipment needed. Standard, Special and Metallic colors available or to order.
WRITE DEPT. MP
• GERING •
Products Inc.
KENILWORTH, N. J.

"Waste Not-Want Not"
Trim to exact size



Jacques
SLITTER and REWINDER

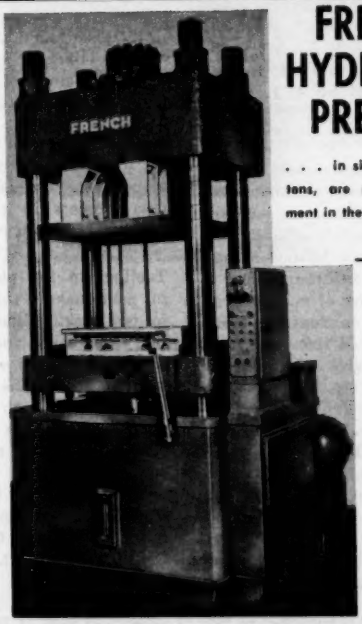
Handling a wider variety of materials faster and at less cost, the Jacques Slitter and Rewinder requires less capital investment. Has choice of contact or razor-type, or a combination of both cutters. New patented frictions. Up to 45" width and 40" rolls

Write today for free folder and fact sheet on plastic slitting.

H
EST. 1882

HOBBS MANUFACTURING CO.
25 Salisbury St., Worcester 5, Mass.

Manufacturers of:
JACQUES hand and power shears, **TRI-POWER** and **AUTOTRONIC** die presses, paper box machinery



FRENCH HYDRAULIC PRESSES

. . . in sizes up to 1,500 tons, are standard equipment in the plastic industry.

Write for our catalog

THE FRENCH OIL MILL MACHINERY CO.
HYDRAULIC PRESS DIVISION
PIQUA, OHIO U.S.A.

BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery.

"Linear Polymers" by Elizabeth M. Frith and R. F. Tuckett

Published in 1951 by Longmans, Green & Co., Inc., 55 Fifth Ave., New York 3, N. Y. 355 pages. Price $3.50

Physical chemistry of the long chain polymeric molecules which comprise plastics is the subject of this book which endeavors to bridge the gap between available information on small molecules and existing data on natural large molecules. Written at the level of the graduate research student, the volume sets out to resolve the diversified original papers and specialized monographs on the subject into a comprehensive text. The three main topics are: various methods of forming high polymer molecules, and devices used to unravel their structure and ascertain their molecular size; polymer properties in solution; and physical properties of bulk polymers.

"A Practical Manual of Rubber Hardness Testing" by A. L. Soden

Published in 1951 by the India-Rubber Journal, Stafford House, Norfolk St., London, W.C.2. 49 pages Price $1.25

Surveying the entire field of rubber hardness testing, this book explains the various hardness standard tests, considers factors affecting the design and use of testing instruments, and describes the method of use and calibration of main instruments now being employed. A bibliography contains 54 references, and four appendices give relevant conversion tables.

"Herbert H. Dow, Pioneer in Creative Chemistry" by Murray Campbell and Harrison Hatton

Published in 1951 by Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York, N. Y. 168 pages. Price $3.50

As founder of the Dow Chemical Co., and as a chemist in his own right, Herbert H. Dow (1886-1930) made a sizeable contribution to the chemical industry. This biography explores his activities in both fields. As a young man, Mr. Dow invented an entirely new method of extracting bromine from the pre-historic brine trapped underground at Midland, Mich. Working with homemade equipment, he started to manufacture bromide, and later added bleach, phenol, magnesium, and synthetic indigo to his line. During the first World War, Mr. Dow was one of the pioneer's in America's successful effort to throw off the monopoly of the German chemical industry. Today the firm he founded ranks as one of the largest volume producers of chemicals in the country.

"Plastics, Scientific and Technological" by H. R. Fleck

Published in 1951 by Temple Press, Ltd., Bowling Green Lane, London, E.C.1., England. 413 pages. Price 40s ($5.60).

This standard work covering the scientific and technological aspects of the plastics industry has been entirely revised for this third edition. It contains a critical survey of literature and a correlation of data of interest to members of the plastics industry concerned with the chemistry and technology of plastics, as well as pertinent tables, diagrams. Latest developments in plastic materials are discussed in detail.

Tooling up for plastics—Designed for mold makers, this 40-page booklet is a practical guide to the selection, application, and heat treatment of the company's steels for plastic molding. It contains answers to such questions as how to get greater production of perfect parts; how to choose the proper mold steel for a specific application; and how to determine the proper balance between engineering, artistic, and profit requirements. *The Carpenter Steel Co., 1937 Palmer St., Reading, Pa.*

Hercocel molding powders—Properties and uses of Hercocel molding powders are presented in this new technical booklet based on A.S.T.M. tests conducted at the firm's Parlin, N. J., plastics laboratories. Contents cover four formulations of Hercocel A and five formulations of Hercocel E, each in a number of flow types. Data are also provided on the new flame-resistant types of cellulose acetate molding powder, and on general-purpose heat-resistant, and high-impact ethyl cellulose powders. Illustrations show applications of Hercocels in many products. *Hercules Powder Co., 900 Market St., Wilmington, Del.*

Fungicide handbook—The newly introduced line of Isotrols (specially designed for industries fungus-proofing plastics, textiles, paint, leather, and wood) are described. Data include specification tables, uses, calculations for formulation, physical test methods, analytical procedures, and government requirements. *Ferro Chemical Corp., P. O. Box 349, Bedford, Ohio*

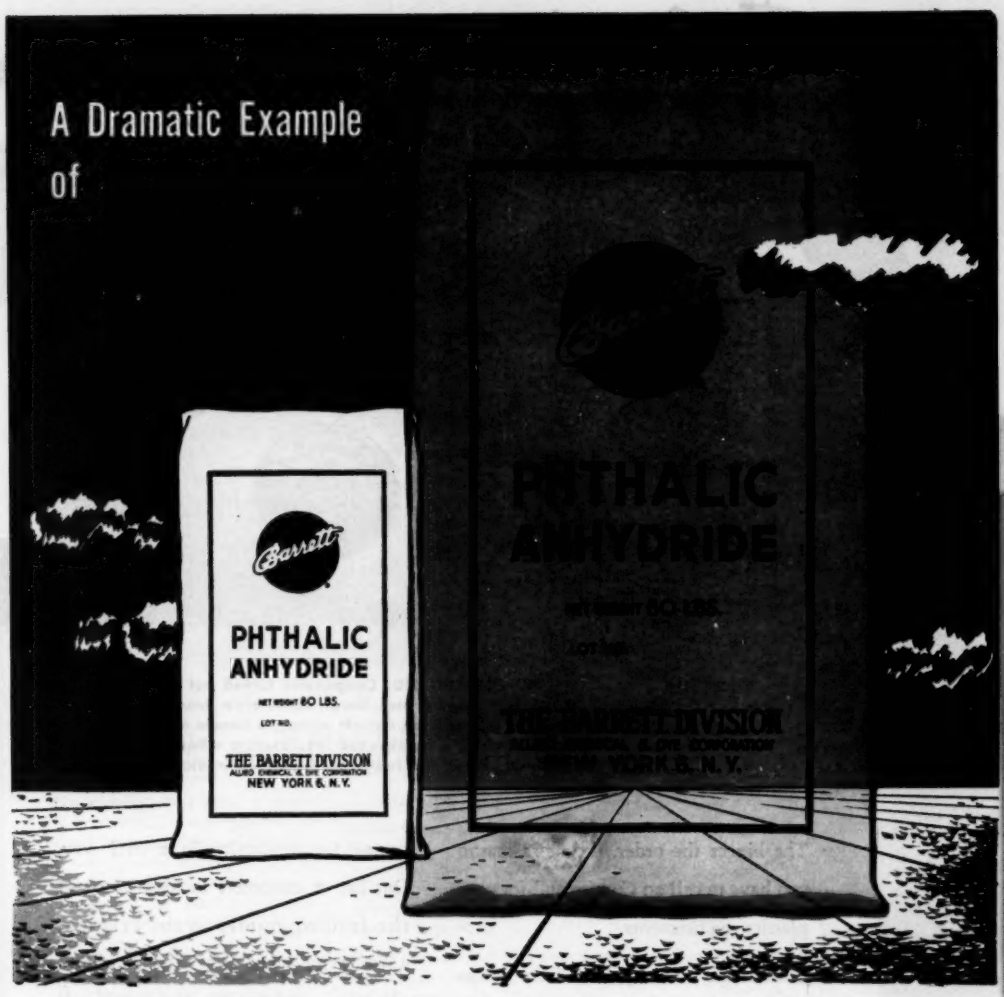
Steam trap selector—This supplement to a previous catalog is claimed to be particularly useful for engineers who have many applications for steam traps. The booklet lists trap capacities, factors of safety, pressure conditions, and installation instructions. *Yarnall-Waring Co., Mermaid Lane, Philadelphia 18, Pa.*

Plastic extruders—The complete NRM line of plastic extruders and auxiliary equipment is described in this four-page bulletin. Covered are NRM extruders ranging from 1 to 8 in., a two-stage extruder for preblending and drying, special dies and haul-offs for film extrusion, and wire and cable covering equipment for saran monofilament extrusion. *Plastics Machinery Div., National Rubber Machinery Co., 47 W. Exchange St., Akron, Ohio.*

Ortho-nitrobiphenyl—This material, a low-cost primary plasticizer compatible with a wide range of synthetic and natural resins, is described in a 10-page bulletin. Suggested formulations of various resins and suppliers of materials are given, in addition to physical, chemical, and tests data. Ortho-nitrobiphenyl is recommended for use in polyvinyl acetate adhesives, polystyrene latex paints, polyvinyl chloride plastisols, nitrocellulose lacquers, and cellulose acetate molding compounds.

(*Continued on p. 155*)

A Dramatic Example of



As defense production has been stepped up, the demand for Barrett* chemicals has grown tremendously.

Among the Barrett products eagerly sought is phthalic anhydride, vital to the production of alkyd resins, phthalate ester plasticizers, and many other important materials.

To meet this great demand, Barrett has taken two decisive steps that will substantially raise the output of phthalic anhydride.

First, the capacities of Barrett's Philadelphia and Ironton plants already have been increased. Second, Barrett is well under way in its plans to build two new plants in Chicago and Philadelphia. The one in Philadelphia alone will increase the production of phthalic anhydride by 36,000,000 pounds each year!

For defense and for civilian production . . . Barrett is expanding to help keep America strong!

* Reg. U. S. Pat. Off.

Barrett*

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

The Quickest, easiest way to turn

NO JOB TOO BIG. Components turned out by Continental cover a wide range of uses. Shown above are a circuit-breaker base, a machine gun grip, an aircraft canopy, a handle assembly, a gun grip assembly, a bomb nose insulator, a wheel assembly, a reproducer throat and fabricated laminated insulating parts.

The bigger the order, the more reason you have to call on Continental for your plastics requirements.

Continental knows plastics from design to finish. Our production lines are equipped with the most efficient machinery for molding and laminating. Our men have years of experience turning out every conceivable kind of plastic component.

Here's proof, too, that Continental is geared for production in a BIG way. Our list of customers includes some of the leading names in the aviation, automotive, appliance, electrical and electronic industries. And they'll tell you that Continental is a dependable source of supply.

Find out how Continental can turn your plans into plastics. We will be glad to consult and work with you right from the design stage.

plans into plastics

CALL ON CONTINENTAL

STRATEGICALLY LOCATED. This modern plastics plant is located in Cambridge, Ohio. Its central location and transportation facilities assure on-time deliveries to all parts of the country.

If it's big and tough to handle--it's our baby!

No matter what your plastics requirements, it will pay you to check with Continental. We have the equipment and experience to handle the biggest kind of plastics assignment. Here is a listing of the processes available at Continental:

Compression and transfer molding for aircraft controls, detonator fuses, junction boxes and other parts.

Injection molding for aircraft components, battery cases, projectile shipping plugs, acid baffles and other related products.

Sheet laminating of industrial "Conolite" for aircraft compartment and fuel cell liners, terminal strips, post-formed antenna housings and many types of insulation parts.

Reinforced low pressure moldings for chemical containers, tote boxes, shipping pallets and housings for electrical and mechanical equipment.

Acrylic sheet forming for aircraft enclosures, gun turrets, blisters, windows and canopies.

CONTINENTAL CAN COMPANY

PLASTICS DIVISION

Cambridge, Ohio

100 East 42nd Street, New York 17, N. Y. • 1721 NBC Building, Cleveland 14, Ohio • Hillcrest – Route 2, Knightstown, Ind.

New Center Building, Detroit 2, Mich. • 135 S. LaSalle Street, Chicago 3, Illinois

PURE

UNIFORM STRENGTH

WATER WHITE

LOW IN ACID

LOW METAL CONTENT

DU PONT FORMALDEHYDE

SOLUTION

DU PONT FORMALDEHYDE is designed to meet the high requirements of the plastic industry. It's completely dependable—produced under controlled conditions to assure consistently fine raw material.

SHIPMENTS of Formaldehyde, Paraformaldehyde, 95% minimum strength, and Hexemethylenetetramine—Technical—are made in standard containers.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

For additional information and technical assistance, call our nearest office.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
Wilmington 98, Delaware

DISTRICT OFFICES

Baltimore 2	321 Fallsway	PLaza 2862
Boston 10	140 Federal Street	HAncock 6-1714
Charlotte 2, N.C.	427 W. 4th Street	CHarlotte 5-5561
Chicago 3	7 S. Dearborn Street	ANdover 3-7000
Cincinnati 2	2412 Carew Tower	PArkway 5253
Cleveland 14	1226 National City Bank Bldg.	CHerry 1-6078
Detroit 26	966 Penobscot Bldg.	WOodward 2-7360
Kansas City 1*	Gwinotte & Mich. Aves.	Victor 6240
Los Angeles	P.O. Box 70, El Monte, Calif.	CUmberland 3-2761
New York 1	350 Fifth Avenue	LOngacre 3-6440
Philadelphia 3	1616 Walnut Street	Kingsley 5-1900
Pittsburgh 22	517 Park Bldg.	GRant 1-2960
San Francisco 6	111 Sutter Street	EXbrook 2-6230

*Berado & Pap, Inc.

DU PONT ELECTROCHEMICALS

DESIGNED FOR PLASTICS

BAYONET IMMERSION CONTACT THERMOCOUPLE

Silver tip hot junction for rapid response with Drill Angle Taper for proper seating. High Temperature Alloy Tension Spring holds thermocouple in place for good thermal contact.

Connector Panel for making and breaking thermocouple circuits rapidly. Available with 1 to 5 connections.

Send for our Catalog P describing these and our other temperature measuring equipment.

Thermo Electric
FAIR LAWN NEW JERSEY

MOLD IT BETTER FASTER MORE ACCURATELY

INJECTION – COMPRESSION PLUNGER and TRANSFER

Considerate and experienced handling of your plastic molding problems is available thru our accurate service, where you will find ample facilities to meet your every plastic molding requirement . . . at maximum efficiency and economy. Accurate invites your toughest problems, offering a complete service for molding thermoplastic and thermosetting materials. Our entire engineering and technical knowledge is at your command . . . NO OBLIGATION.

SPECIALISTS IN SMALL RUNS USING HAND MOLDS

ACCURATE MOLDING CORPORATION

Other uses are in the manufacture of dyestuffs, and as an anti-blooming agent in paintable pentachlorophenol formulations for the preservation of wood products. *Monsanto Chemical Co., St. Louis, Mo.*

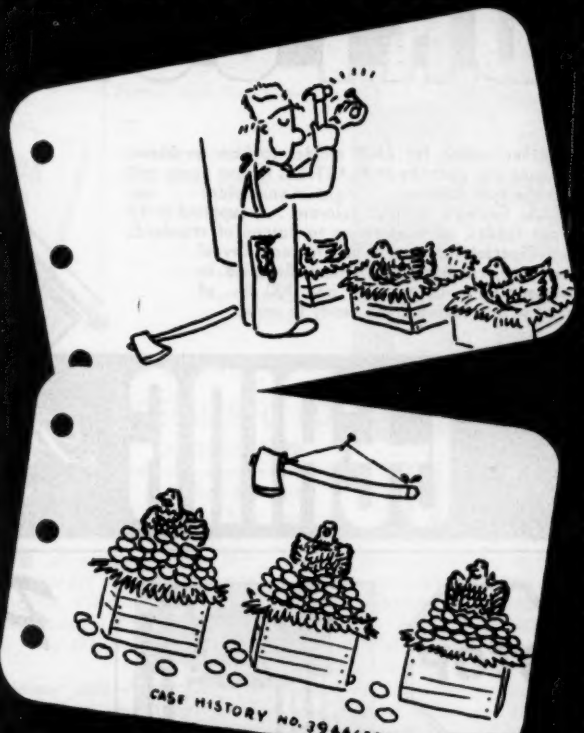
Industrial polishing and buffing—Modern techniques of industrial polishing and buffing as related to the buffs, polishes, and plating supplies produced by the company are described in this 12-page booklet. Technical information explains how to get better results in metal, plastics, and wood polishing operations, and defines "cutting down" and "coloring" operations in the buffing process. Compounds suitable for each material and process are listed, along with a formula for determining the peripheral speed of polishing wheels. *Schaffner Mfg. Co., Herron & Schaffner Aves., Emsworth, Pa.*

Milling and cutting tools—Contained in this 12-page circular is price data and descriptive information on the company's milling cutters, slitting saws, end mills, shell end mills, keyseat cutters, and T-slot cutters. Helpful data on the selection of the proper tool for various jobs is given, together with information on special cutters, regrinding, and increasing tool life by the use of soluble oils. Tabulated data recommended by milling machine manufacturers on speeds and feeds is included. *The DoALL Co., 254 N. Laurel Ave., Des Plaines, Ill.*

Glass fiber reinforcements—Specifications for the yarns and superfine glass fiber to be manufactured by the firm's new Fiber Glass Div., are fully outlined in a pamphlet. Listed are 18 different yarns, marketed in seven forms, and 22 superfine glass fiber products in three groups suitable for aircraft insulation, life jackets and flotation equipment, and automotive and refrigeration insulation. Aerial views of principal company factories are included. *Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, Ohio.*

Basic facts about materials handling—Efficient handling of raw and finished materials, their proper storage, and how modern materials handling machines cut manufacturing costs are the areas covered in this 24-page booklet. Specific questions that come

INGENUITY
can solve any problem



if YOUR PROBLEM involves the higher production of threaded parts

HY-PRO TAPS
can help you to a solution

HY-PRO TOOL CO.
NEW BEDFORD, MASS., U.S.A.
Subsidiary of
Continental Screw Co.

Order from your distributor or call the HY-PRO SALES ENGINEER

KEY to easy, on-the-spot coloring of ALL PLASTICS:

DRYCOL

No further reason for ANY molder to have problems in coloring any quantity of PLASTICS. If your needs call for on-the-spot coloring . . . right in your plant . . . use DRYCOL, Gering's "magic" colorant . . . supplied in 17 brilliant shades, all conforming to Bureau of standards colors. (Special colors may be ordered). Drycol is dust-free, compact, economical. Supplied in convenient units to color 50 and 100 lbs. of plastics in any mixing drum, ready to mold.

Sample packet for 100 lbs. furnished gratis. Call on our technical service department for recommendations.

Write Dept. MP

GERING

Products Inc.

KENILWORTH, N. J.

with EEMCO processing machinery

EEMCO presses, mills, refiners and crackers offer a minimum of production delays. Engineered right, built right and of best obtainable materials, EEMCO rubber and plastics processing machinery is serving many manufacturers throughout the world. Write for quotations on standard models or units built for your special needs. You will like the attractive prices and quicker deliveries.

RUBBER & PLASTICS MACHINERY DIVISION

EEMCO ERIE ENGINE & MFG. CO.

ERIE PENNA.

Plastics Molding

for America's

LEADING MANUFACTURERS

ALL MATERIALS — ALL METHODS

Northern

40 YEARS OF
PLASTIC MOLDING EXPERIENCE

INDUSTRIAL CHEMICAL CO.

11 ELKINS ST., SO. BOSTON, MASS., SOuth 8-4240

BRANCH OFFICES

SPECIAL FABRICS
for
COATING &
LAMINATING

FLIGHTEX
FABRICS

• COTTON
• VINYON
• RAYON
• DYNEL

If you use special fabrics for coating and laminating, you'll find Flightex a dependable source of supply. Our staff of engineers is at your service to help solve your problems.

Write for Complete Information

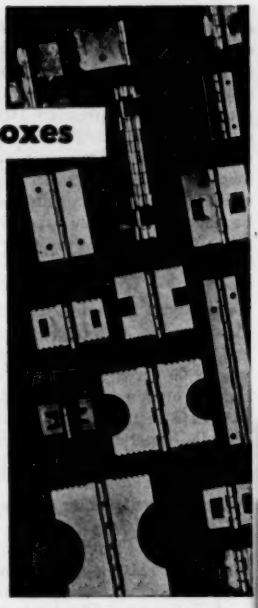
FLIGHTEX FABRICS, Inc.
87 Worth Street New York 13, N. Y.

HINGES
for plastic boxes

Custom Made

Spring and Non-Spring
for
push-fit assembly
drive screw assembly
rivet assembly

Send samples, prints or sketches for quotation.



GEISSEL MFG. CO.
INCORPORATED
109 Long Avenue
Hillside, New Jersey

HINGES

up for analysis include how to combine small units into larger ones for more efficient handling; how to route materials; how to utilize "overhead" space for storage; how to use trailer trains; and how to utilize limited manpower effectively. Latest equipment in the materials handling field is discussed, together with methods for estimating cost of operation. Cost analysis information includes how to figure amortization of machine investment, fixed charges, and charges that vary from job to job. *Clark Equipment Co., Industrial Truck Div., Battle Creek 62, Mich.*

Company facilities—Illustrations of more than 50 common peacetime applications of the company's preplated metals, and a description of the firm's conversion to wartime production contained in this booklet. Enumerated in detail are the concern's machinery, tools, presses, power, dock facilities. The plating finishes offered are copper, chromium, nickel, and brass on such bases as steel, brass, copper, aluminum, tinplate, nickel, silver, and zinc. The firm can expand its finishes to include zinc, cadmium, silver, and anodizing aluminum. These preplated metals are available in sheets, coils, or flat wire in a variety of gages and tempers. *American Nickeloid Co., Box 127, Peru, Ill.*

Phenylacetic acid—Properties and specifications of phenylacetic acid are given in this eight-page bulletin, accompanied by a list of suggested applications that include intermediate for drugs, such as antispasmodics, sedatives, antiseptics, and anticoagulants; for perfume aromatics; and for insect repellants. Within the past few years the product has been widely used as precursors for penicillin. *Kay-Fries Chemicals, Inc., 180 Madison Ave., New York 18, N.Y.*

Director of defense agencies—Publication of a revised "Directory of Federal Government Defense Agencies in Chicago and Washington" has been announced. This aid to business men lists 48 offices of 35 different defense agencies, including names, titles, addresses, and telephone number of principal officials. Reinstituted after the recent mobilization, the directory is subdivided into three main sections: emergency agencies with Chicago and Washington addresses; emergency agencies with only Washington addresses; and principal federal government purchasing offices in Chicago. *The Chicago Association of Commerce & Industry, 1 N. LaSalle St., Chicago 2, Ill.*

Sub-contracting facilities—Facilities and available materials of interest to military contract holders are outlined in this eight-page booklet. Information includes a listing of the available production machinery; location of the factories, with floor space and security provisions; description of normal and military production; research and development facilities; and management and finance. *Rogers Corp., Manchester, Conn.*

From plans to plastics—A partial list of products available from the company is given in an eight-page brochure under such headings as thermosetting plastics, molding thermoplastics, finishing molded parts, polyester thermosetting laminates, reinforced low pressure molding, and

acrylic sheet forming. Applications of industrial and decorative Conolite are also included. Facilities for producing the components include 58 presses for compression, transfer, and plunger molding of 50- to 750-ton capacity; 19 injection molding machines of 2- to 80-oz. capacity, and a continuous laminator, said to be the largest of its type. *Plastics Div., Continental Can Co., Cambridge, Ohio.*

Gas-analysis manual—Fourth revised manual describes the theory and practical application of gas analysis in 60 pages, including the procedures involved in various analyses. Complete instructions on maintaining and operating the company's equipment are given, along with illustrations and descriptions of the apparatus itself. *Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa.*

Planning catalog—Explaining the need for and the functions and advantages of three-dimensional planning and outlining and illustrating the company's Repro-Templet system of producing reproduction prints is an 80-page catalog. In addition to including data on prices, shipping, and delivery, the booklet itemizes over 6000 standard stock items, such as machine tools, material handling equipment, shop apparatus, and office planning equipment. *"Visual" Planning Equipment Co., Inc., Oakmont, Pa.*

Chemical processing equipment and blowers—Published as a 12-page insert for forthcoming editions of "Chemical Engineering Catalog" and "Sweet's File for the Process Industries," this catalog lists specifications for the company's chemical process equipment and Standardaire blowers. It covers material handling equipment, such as bins, conveyors, elevators, sifters, and weigh hoppers; various types of mixers; and blowers. *Reed Standard Corp., York, Pa.*

Vacuum impregnation—The process of vacuum impregnation, which introduces an impregnating agent into a chamber where a high vacuum has been drawn, is explained in detail in this 32-page brochure. Through the use of this process, many materials can be treated with impregnants which would be difficult or impossible to treat under atmospheric pressure. Among the many applications suggested in the booklet are insulation of electrical equipment, including armatures, capacitors, coils, cables, and transformers; filling of thermometers and small bottles; weatherproofing papers and textiles; bleaching and dyeing baseball bats; and inking typewriter ribbons. Also described and illustrated is equipment used in vacuum impregnation. *F. J. Stokes Machine Co., 5500 Tabor Rd., Philadelphia 20, Pa.*

Bibliography of forest industry educational materials (1951-52)—Published by American Forest Products Industries, Inc., this 12-page booklet lists leaflets, motion pictures, posters, filmstrips, and other educational materials that have been made available by individual forest industries. In addition to describing these materials, the bibliography gives complete data on how each may be obtained. Most materials listed are available without charge. *American Forest Products Industries, Inc., 1319 Eighteenth St., N.W., Washington 6, D.C.*

BUSHINGS • CASTERS • BASES • GEARS • HOUSINGS • COVERS

FIBERITE

Phenolic *Melamine*

Impact Molding Compounds

GENERAL TYPES APPLICATIONS

Flock .....Lower Impact
Fibrous .....Delicate inserts, thin walls
Light Fabric ..Resiliency, Moldability, high strength
Heavy Fabric ..Industrial & heavy duty
Cord .....Highest impact

Controlled Flow. Grades available for compression, transfer and plunger molding. All materials produced in bulk or high density custom-made preforms, Eastern and Midwestern representation.

Address inquiries to:

FIBERITE *Corporation*

516 West Fourth Street
Winona, Minnesota

GUN GRIPS • PULLEYS • CAPS • CASES • CAMS • TRAYS

PLASTIC MOLDS

The above mold, weighing 5 tons, measuring 62" x 32" x 14", was made for the Panelyte Division of St. Regis Paper Company.

Send for our bulletin on your company letterhead.

EAGLE TOOL AND MACHINE COMPANY
37-39 FREEMAN ST.,
NEWARK 5, N. J.
TELEPHONES: MARKET 3-1572-73

SINCE 1918

M&M plastic granulator

In today's market the use of every available piece of scrap has become increasingly important. The M & M Plastic Granulator designed for "on the job grinding" can turn the material from your scrap barrel into usable granules and extra profit. Investigate today!

mitts & merrill

1016 South Water • SAGINAW, MICHIGAN

Shawnee

DRY COLORS

COLORS FOR PLASTICS

•

Strontium Chromate Yellow

•

Ming (Molybdate) Orange

•

Organic Red, Maroons
Blue & Green Toners

•

Red & Yellow
Cadmium Toners
(Subject to limitations of NPA Order M-19)

•

Offerings based on extensive experience with leading plastics manufacturers

KENTUCKY COLOR & CHEMICAL CO.
Incorporated

General Office and Works: Louisville, Ky.
Branches and Representatives in Principal Cities

WIN a FREE
10 day* Flagship Airtour for 2 in..
MEXICO

Tell us how YOU have used decals in your industry!

*AMERICAN AIR LINES

Here's An Effective Use Of
MEYERCORD
DECAL NAMEPLATES

Save Metal! Expedite Civilian Or Defense Production with DECALS!

Problem-solving Meyercord Decal Nameplates are again being drafted to save critical metals—both for defense *and* civilian production! Combat-tested and approved during the last war, Meyercord Decal nameplates are the standard of reliability for instructions, charts and diagrams—in all sizes, colors or designs. To save time, labor and materials, civilian production uses Meyercord Decal nameplates for quick application on all basic product surfaces, curved or flat, on metal, glass, wood, plastic, leather, rubber, crinkle. Manufacturers who have Armed Services contracts *are invited* to use Meyercord's FREE technical service in solving identification or marking problems. No obligation!

FREE!

Write for full-color booklet of the many problem-solving uses of Meyercord Decals Dept. 7-11

CONTEST ENTRY BLANK! MAIL TODAY!

WHAT YOU WIN: A delightful, all-expense ten-day holiday in colorful Mexico for two persons. RULES OF CONTEST: Write a letter in 200 words or less, describing an effective, problem-solving use of Decalcomania by your company or industry. Contest is open to any commercial user of Decalcomania, regardless of type of usage or source of supply. You do not have to be a Meyercord customer. Coupon is your official entry blank. Fill out and attach to entry. Please use Company letterhead. Contest ends midnight, January 15, 1952. All entries become the property of The Meyercord Company. Decision of judges shall be final. In case of a tie, duplicate prizes will be awarded. Winners' names will be published. Employees of The Meyercord Company, its retail dealers or advertising agency are ineligible. JUDGING: Entries will be judged on the basis of practical and interesting problem-solving uses of Decalcomania. Enter the Contest TODAY! Anyone can Win! Attach this entry blank to your letter and mail to The Meyercord Co., 5323 W. Lake St., Chicago, Illinois, Box 7-11

Name_____

Address_____ Firm_____

City_____ State_____

Consult Waterbury for MOLDED PLASTICS

Creative Service in Product Development

Research, Design, Engineering
Compression, Transfer, High Speed Injection and Low Pressure Molding
Over a Century of Fine Tool and Mold Work
Finishing, Assembling

PRODUCERS OF PLASTIC CONTAINERS FOR MANY WORLD FAMED PRODUCTS

SALES OFFICES

NEW YORK 17, N.Y.
17 East 42nd St.
BOSTON 11, MASS.
99 Chauncy St.
CHICAGO 6, ILL.
223 W. Jackson Blvd.
PHILADELPHIA 3, PA.
117 South 17th St.
ROCHESTER 5, N.Y.
L. W. Sage, Inc.
33 University Ave.
DETROIT 7, MICH.
Wm. Robert Wilson & Associates
6460 Kercheval Ave.

Our technical staff will gladly confer with you.

Write for Waterbury Plastics Catalog "M"

WATERBURY COMPANIES, INC.
Waterbury, Conn.

INTERNATIONAL PLASTICS NEWS*

Activities Around the World of Interest and Importance to the Plastics Industry in the United States

Australian Plastics Expansion—Market expansion of the already growing plastics industry in Australia is expected to follow a recent announcement that Imperial Chemical Industries of Australia and New Zealand Ltd. will spend a sum of £A3 million ($6,675,000) on its plant at Botany, New South Wales, to increase manufacture of polyvinyl chloride from the present 1000 tons to 6000 tons a year. In addition to present production at the Botany plant, Australia has been importing resin from Britain and the United States.

I.C.I.A.N.Z. Ltd.'s new project comes at a time when the local plastics industry is experiencing a phase of rapid development. In Australia, as in other countries, plastics have now become an important part of engineering, and local manufacturers believe that it has a promising future in the industrial field generally.

A recent official survey of the Australian industry states that there are approximately 1250 compression molding presses in Australia, ranging from 25 tons to 5000 tons capacity. The number of injection molding machines is between 180 and 200.

Australia makes the majority of its compression molding presses. Injection machines of a high standard also are being made locally, but at present most of the machines in use have been imported mainly from the United States. Most of the extruding machines have been imported from Britain and the United States, but because of the dollar position it is difficult at present for manufacturers to obtain American machines.

Vinyl plant in Brazil—Arrangements have been concluded for the formation of a plastics manufacturing company, Geon Do Brazil, to be jointly owned by B. F. Goodrich Chemical Co., Cleveland, Ohio, and S. A. Industrias Reunidas F. Matarazzo. The new firm will have initial production capacity of 6 million pounds of Geon polyvinyl material annually.

Plants to be built near Sao Paulo will manufacture vinyl chloride monomer, Geon polyvinyl chloride resins, and Geon plastics compounds. The facilities are expected to be completed late in 1952 or early in 1953. The plants will be operated by Brazilian personnel.

Plastics products in Australia—Pierwood Plastics Ltd., Sydney, N.S.W., has entered into an arrangement with Louis Marx & Co., New York, N.Y., which provides for a new Australian company to supervise production and distribution of Marx plastics items in Australia. The capital will be provided equally by Pierwood and Marx.

Pierwood has also made arrangements with Standard Tool Co., New York, N.Y., by which Pierwood will acquire the Australian and New Zealand rights to the Stancasting process, a precision method of casting stainless steel.

Plastic Moulders Ltd., a New Zealand company, is affiliated with Pierwood in these two ventures.

Meeting on standardization—The first meetings of the International Technical Committee on Plastics were held in New York, Sept. 17 and 18. Representatives from seven countries took part in the meetings, which were organized under the International Organization for Standardization.

A program for future work was drawn up, and five working parties were formed to handle the program. The primary objectives for the immediate future are standardization of nomenclature, and the development of test methods applicable to plastics.

The five working parties organized and the countries that have the leadership for each are: flexural

* Reg. U. S. Pat. Office.

POLYESTER RESINS..... *Dr. Earle Ebers*

Ever since Dr. Earle Ebers delivered his comprehensive paper on polyesters at the National Technical Conference of the Society of Plastics Engineers earlier this year, wide interest in his report has been expressed.

For this reason, Naugatuck here reprints highlights of that report. As many of you know, Dr. Ebers and his Naugatuck associates are among the polyester pioneers who have contributed to the phenomenal growth of this remarkable resin.

If you wish the full text, the coupon below will bring it to you, along with the other data specified.

In 1942, polyesters, as we now generally know them, were born and a new class of thermosetting resins of the following properties was available:

- **Good aging**
- **100% reactivity**
- **Rapid curing without porosity**
- **Wide viscosity range**
- **Good chemical resistance**
- **Good electrical properties**
- **Good abrasion resistance**
- **Wide color range**
- **Good temperature shock resistance from −80° F. to 212° F.**

In combination with fibrous fillers such as nylon, cotton, sisal, rayon, paper and, in particular, glass, polyesters have the above properties plus:

- **High specific tensile and flexural strength**
- **High impact resistance**

WAR USES: The handling properties of low viscosity, 100% reactivity and rapid curing without porosity under no or a minimum pressure permitted that American production ideal of continuous operation in the lamination of glass cloth. Large quantities of sheet stock of this nature were made. These were used as support panels for self-sealing gasoline tanks in aircraft.

More complex aircraft structures such as air scoops, water and de-icer tanks, wheel farings and ducts quickly followed as experience with these versatile polyester resins grew because they gave:

- **Weight savings**
- **Elimination of costly tooling**
- **Man and machine hour savings**
- **Versatility**

The excellent physical and dielectric characteristic of these laminates were utilized in radomes.

WAR DEVELOPMENTS: Experimentation on structural sections such as the BT-15 airplane fuselage by the AAF Material Command, Wright Field, clearly demonstrated that polyester fibre glass laminates compared to metals and, in particular, 24 ST aluminum have:

- **Higher specific strengths**
- **Greater damping capacity**
- **Better thermal insulating properties**
- **Better acoustical insulating properties**
- **Possible fabrication advantages in time savings and simplified structures**
- **Greater adaptability to variable gauge sections**

These advantages were further borne out when the constructions of the Sikorsky Aircraft B-6 Helicopter cabin was changed from metal to plastic with:

- **Over 10% saving in weight**
- **Greatly reduced noise level**
- **A reduction in parts to assemble from several hundred to only 26**
- **Approximately a 50% reduction in production time**

Simple boat structures were a "natural" and appeared early on the scene.

A great developmental saga had been written and enthusiasm was rampant for the post-war possibilities of this Cinderella when the war came to a close and the fairy godmother was gone.

Polyester resin sales rose from perhaps 1,500,000 pounds in 1946 to 7-8,000,000 pounds in 1950 and these resins were used in the following amazing variety of products.

CONTINUOUS LAMINATIONS: This was probably the first and simplest conversion: Two polyester-bonded glass cloth products finding peacetime usage as cargo liner and photo template. Immediate introduction of a paper laminate into the wall board and decorative table top field also helped to absorb some of the capacity of these machines.

CAST SHEET AND TUBING: Abrasion resistance and good optical clarity are utilized for glazings, while the excellent electrical characteristics of these resins lead to parts for electronic and radar equipment. Further, they replace more expensive amber in x-ray equipment.

FISHING RODS: By applying the very high strength-to-weight ratio of polyester-bonded parallel glass fibres to rod-making, in analogy with the natural bamboo product, this new fisherman's delight was born.

BOATS: This application was a logical extension of the armed services' experimentation in this field. With new techniques, commercial boats of more versatile design are being built with 45 to 90% savings in man-hours. Other plusses are lighter weight, salt water resistance, imperviousness to rot and worms, no annual caulking and high impact resistance.

LUGGAGE AND CARRYING CASES: The abrasion resistance, high strength properties, light weight and integral color lend themselves to attractive carrying cases for musical instruments and luggage.

AUTOMOTIVE: Lightweight, ease, and economy of repairs are the main advantages. Competitive costs have only been obtained to date in cases such as trailer fenders and electric cruising car bodies where the total of pieces required was small.

SEALANT FOR POROUS CASTINGS: Excellent against petroleum products and thermal shock.

LAMP SHADES: High light transmission permits lower wattage bulbs. Easy cleaning, strength and resistance to heat and moisture are other features.

OUTDOOR SIGNS: Good weathering, toughness, lightweight and integral color contribute to low maintenance costs.

STREET LAMP GLOBES AND REFLECTORS: Toughness towards sharp stones, good light reflectance, and good weather resistance make this a highly practical application.

TRUMPET MUTES: This is a typical example of the hollow articles which might be made in a single piece, having no joints to develop weakness under continuous vibration.

PROJECT TOOLS: Polyester glass laminate project tools in the aircraft industry give large time and money savings over metal tools and do a better job. They are less liable to distortion and damage in service.

LARGE PIECES: That size is no limitation to polyester glass laminate structures is evidenced by the 650-pound synchroton piece and the 700-pound Westinghouse photometer sphere made from them. High strength, good dimensional stability, excellent electrical properties and weight savings are additional features.

MOLDINGS: The fast curing of polyesters has given molding compounds for the electrical industry—with very high tracking resistance and 30-90% greater productivity. Other special formulations give rapid production of television antenna holders and tough, colorful battery boxes.

FUTURE OF POLYESTERS:

Now comparative to the technology of woods and some metals, the chemist and engineer have hardly turned the first pages in their thinking on polyesters and polyester fibre combinations. If, as established in the 1946-1950 period, these are already competitive in many cases, can there be doubt as to their future potentialities?

Structures from buttons to atom smashers, flat sheet to B-29 duct work, and work trays to radomes, attest to the handling and physical properties and versatility of these materials.

In conclusion, it is suggested that application of your creative imagination and ingenuity to these materials will yield high rewards similar to those attained by the dreamers of 1944 and 1945, a large percentage of whose ideas are now commercial realities.

Outstanding Vibrin Polyester properties: Easy to handle—lightweight finished products • Cures without porosity • 100% reactivity—no weight change • Electrical grades—low water absorption • Wide hardness range • Full color range • Flame-resistant types

Naugatuck Chemical

Division of UNITED STATES RUBBER COMPANY
NAUGATUCK, CONNECTICUT

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • New York
Philadelphia • In Canada: Naugatuck Chemicals, Elmira, Ontario

Naugatuck Chemical Plastics Division, Elm St., 27, Naugatuck, Conn.

Please send complete paper on polyesters. ( ) Without charge, send technical data on Vibrin properties, uses, handling methods (specify desired and products).

I understand that, from this data, I can order suitable, free experimental samples.

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

MARVINOL vinyl resins • KRALASTIC styrene copolymers • VIBRIN polyester resins

Nacromer
A PEARLY PIGMENT

NACROMER is an excellent substitute for Pearl Essence where cost is a factor and where the high brilliance of natural pearl is not necessary.

It is—

- **Stable**
- **INERT**
- **NON-CORROSIVE**

Sample and literature sent on request.

THE MEARL CORPORATION

153 WAVERLY PLACE NEW YORK, N. Y.

"World's Largest Producer of Pearl Essence"

Plastic or Celluloid fabricating Equipment

1 FOUR TON, AIR OPERATED TOGGLE PRESS
2 POWER JIG SAW
3 BEVELER
4 HAND LEVER PRESS
5 ELECTRIC STEAM TABLE
6 DEGATOR

Designers and builders of INJECTION MOLDS

STANDARD TOOL CO.
83 WATER STREET, LEOMINSTER, MASS.
Outfitters to Plastics Mfrs. Since 1911
OMNI PRODUCTS CORP., Export Distributors, New York, N.Y.

and other strength properties of plastics, Netherlands; thermal properties of plastics, United States; water absorption and other physical chemical properties, United Kingdom; equivalent terms, France. An invitation is being extended to Sweden to accept the leadership of the working party on standard laboratory atmospheres and conditioning procedures.

The countries represented, other than those mentioned above, were Australia and Switzerland. The meetings were under the chairmanship of Dr. G. N. Kline of the United States Bureau of Standards, technical editor of MODERN PLASTICS.

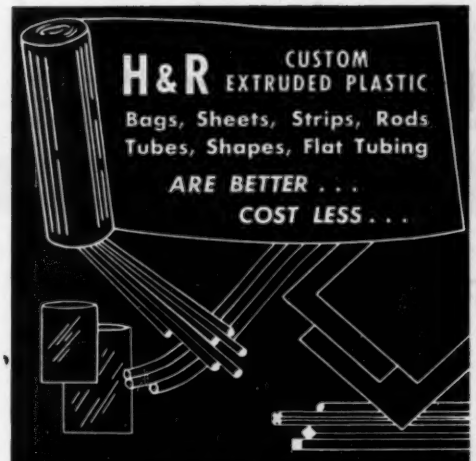
Resin plant for Brazil—A complete line of synthetic resins for the paint and varnish, plywood, paper, and textile industries will be manufactured in Brazil by Resana S.A. Industrias, Quimicas, Sao Paulo, under an agreement with Reichhold Chemicals, Inc., Detroit, Mich.

A new plant, incorporating the latest resin manufacturing techniques employed in Reichhold operations in the United States and Europe, will be erected by Resana on the outskirts of Sao Paulo.

At the same time, a new company, Reichhold Chemicals do Brasil S.A., is being organized to take over Brazilian sales of the materials made in Reichhold's U.S. and European plants as well as those manufactured by Resana. Reichhold Chemicals do Brasil will be headed by Guilherme Levy, who continues as director of James Magnus, Ltda., Reichhold's former Brazilian agent. The new company will maintain sales offices in Rio de Janeiro, Sao Paulo, and other principal Brazilian cities.

Official for Japanese company—The Foreign Dept., Monsanto Chemical Co., St. Louis, Mo., has announced the appointment of Albert W. Dunning as vice president of Monsanto-Kasei Kogyo, K.K., Tokyo, Japan. Mr. Dunning has been sales manager of resins and raw materials for the Plastics Div. of Monsanto. His early youth was spent in Japan, where his father was a professor of English.

Monsanto-Kasei Kogyo was formed in August as an associated company of Monsanto and the Nipponkasei Chemical Industries, Ltd., Tokyo.



H&R CUSTOM EXTRUDED PLASTIC

Bags, Sheets, Strips, Rods
Tubes, Shapes, Flat Tubing

ARE BETTER . . .
COST LESS . . .

H & R offers a complete custom extrusion service capable of turning out the right plastic material in the exact form you need, at a price you'll appreciate. We are fully equipped to make all necessary dies and to fabricate heavy polyethylene with hot gas welding.

Send us your problem—we'll be glad to send samples, recommendations and quote prices. Absolutely no obligation on your part.

H & R INDUSTRIES

344 E. Walnut St., Nazareth, Penna.

ACRO LIQUID INKS

Are excellent for marking with stamps, brushes, fountain pencils and machines. All standard colors are available.

MACHINES

The machine shown uses liquid ink for printing trade-marks and numbers on plastic tubes and rods. A hopper fed marking machine built by the makers of hot stamping machines and a full line of plastic marking equipment.

"The Original Marking Specialists"

The ACROMARK *Company*

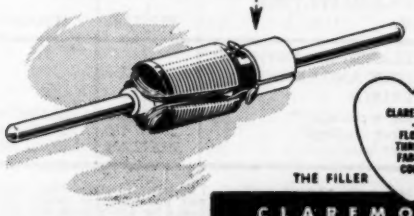
5-15 MORRELL ST., ELIZABETH 4, N. J.

Claremont

A PLASTIC PART THAT "DOES ITS PINCH OF FLOCK PROUD"

Application, Courtesy of American Flyer Trains The A. C. Gilbert Co. New Haven, Conn.

Molded by Teal Molding Co., Inc. New Haven, Conn.



You'd have a tough time trying to break this tiny-sized Commutator!

It is molded of Resinox 4315* strengthened with CLAREMONT Cotton Flock

Within the walled confines of a midget-sized cylindrical copper shell, a hard, holed-through core of Claremont flock-filled phenolic is molded in place! A tribute to precision processing! When cleaned, grooved and pronged, this piece serves as a functional part of a toy locomotive armature—and most important to the steady, dependable, long-life performance of American Flyer Trains!

Claremont Flock... Plastics' Muscle Ingredient

Claremont produces four graduated-strength types of fillers (Flock, Thread, Fabric, Cord). Many millions of pounds of Claremont Fillers are already doing their share to make many millions of plastic parts functionally strong! Claremont Fillers in neutral, black or color and in quantities sufficient for your laboratory test runs are available upon request. Write today for complete details.

THE FILLER IS THE HEART

*A Monsanto high impact strength formulation

CLAREMONT WASTE MFG. COMPANY

The Country's Largest Manufacturer of Flock

CLAREMONT, NEW HAMPSHIRE

Stamp Names or Trademarks
ON YOUR PLASTIC PRODUCTS
with the easy-to-use Kingsley

Up to 1,000 stampings per hour.

No skilled operators necessary.

Uniform, clean-cut stampings in gold or colors.

Write us about your marking requirements. Enclose a sample or dimensions of part to be stamped. We'll reply air mail with complete details on how a Kingsley Machine can be applied to *your specific need.*

Kingsley STAMPING MACHINE CO.
1606 SAHUENGA BLVD., HOLLYWOOD 28, CALIF.

REMOVES FUMES—DUST FASTER!

High Quality
PRESSURE BLOWER
only $49.50
REG. PRICE $70.00

For the fast, efficient elimination of welding fumes, sawdust, or other air impurities, you can depend on this precision-made, all-aluminum high-pressure blower. Made with 5 1/2" inlet and 3 1/2" outlet. Enclosed 1/4 H.P. Westinghouse single phase motor, 115 V. A. C., provides 3450 R.P.M. and up to 450 C.F.M. Immediate delivery! Ask for =BL50W.

STANDARD ELECTRIC
MFG. CO., INC.
WEST BERLIN, N. J.

Production of

FOR the purpose of this report, production is the sum of the quantities of materials produced for consumption in the producing plant for transfer to other plants

PLASTICS AND SYNTHETIC RESIN PRODUCTION From Statistics Compiled

Materials	*Total p'd'n. first 7 mos. 1951*	*Total sales first 7 mos. 1951*
CELLULOSE PLASTICS:[a]		
Cellulose acetate and mixed ester plastics:		
Sheets, under 0.003 gage	9,771,370	9,755,845
0.003 gage and over	7,309,546	7,238,951
All other sheets, rods and tubes	3,793,033	3,646,176
Molding, extrusion materials	43,949,059	41,805,422
Nitrocellulose:		
Sheets	4,227,348	3,583,052
Rods and tubes	669,533	718,111
Other cellulose plastics[b]	7,511,792	7,502,336
PHENOLIC AND OTHER TAR ACID RESINS:		
Laminating	47,755,706	33,057,281
Adhesives	45,713,089	22,694,613
Molding and casting materials[a]	141,563,605	124,743,127
Protective coatings (unmodified and modified except by rosin)	17,034,262	12,680,997
Miscellaneous uses	45,531,307	43,556,282
UREA AND MELAMINE RESINS:		
Adhesives	52,111,176	48,699,481
Textile-treating resins	15,767,017	13,323,861
Paper-treating resins	9,103,824	8,768,249
Protective coatings, modified and unmodified	17,376,213	12,183,211
Miscellaneous uses, including laminating and molding[c]	52,882,305	46,496,627
STYRENE RESINS:		
Molding materials[a]	148,169,905	142,222,857
Protective coatings, modified and unmodified	25,792,461	24,533,402
Miscellaneous uses	33,643,573	29,683,409
VINYL RESINS:[d] Total	263,087,698	245,559,223
Sheeting and film (resin content)[e]		99,919,230
Adhesives (resin content)		8,285,249
Textile and paper-treating resins (resin content)[f]		26,363,205
Molding and extrusion materials (resin content)		82,292,369
Protective coatings (resin content)		15,311,432
Miscellaneous uses (resin content)		13,352,738
COUMARONE-INDENE AND PETROLEUM POLYMER RESINS:	99,353,787	98,605,016
MISCELLANEOUS SYNTHETIC PLASTICS AND RESIN MATERIALS:		
Molding materials[a, g]	44,132,029	39,928,700
Protective coatings[h]	10,557,475	12,172,036
All other uses[i]	61,272,204	57,952,556

[a] Dry basis unless otherwise specified. † Revised. [a] Includes fillers, plasticizers, and extenders. [b] Includes sheets, rods, and tubes, and molding and extrusion materials. [c] Data on resins for laminating and miscellaneous uses are on a dry basis; data on molding materials are on the basis of total weight. [d] Production statistics by uses are not representative, as end-use may not be known at the time of manufacture. Therefore, only statistics on total produc-

Plastics Materials

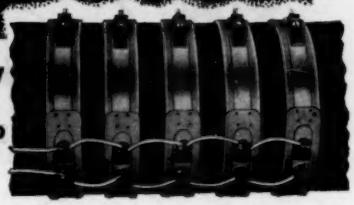
of the same company, and for sale. Sales include only the quantities involved in bona fide sales in which title passes to the purchaser.

IN POUNDS* FOR JUNE AND JULY, 1951
by U. S. Tariff Commission

June 1951		*July 1951*	
Production	*Sales*	*Production*	*Sales*
1,443,924	1,526,588	1,625,021	1,618,717
951,700	922,649	989,532	958,473
496,694†	430,782†	447,337	460,463
6,274,270†	6,136,413†	5,766,292	5,733,425
670,321†	506,463†	427,963	341,559
78,584†	122,985†	80,184	83,541
887,273†	910,507†	801,430	964,885
6,349,141	4,459,165	5,295,495	3,475,726
3,427,928	3,376,877	3,252,878	2,848,327
20,825,718	18,259,146	19,070,773	15,876,020
3,459,882	2,662,536	2,521,600	1,904,371
6,508,914	6,234,094	6,052,034	5,254,041
6,159,184	5,395,167	5,266,046	4,966,559
1,952,092†	1,775,682†	1,458,597	1,513,480
1,534,266	1,576,159	843,910	991,320
2,232,782	1,352,331	1,162,262	912,427
7,400,460	6,553,113	6,209,730	5,364,738
22,754,347	21,450,950	25,689,129	23,731,005
4,030,742	3,521,034	3,971,292	3,794,225
4,360,532	3,590,764	4,802,856	3,969,010
39,208,696	37,213,201	39,531,024	35,463,554
	14,186,081†		14,080,646
	1,591,451		1,681,233
	3,853,268		3,852,013
	13,357,200		11,495,969
	1,763,872†		1,774,392
	2,461,329		2,579,301
13,227,134	13,217,928	12,471,112	12,375,681
6,279,896	5,502,418	5,517,213	5,049,892
1,367,434	1,410,665	1,289,576	1,433,687
9,380,626	8,329,963	6,939,811	6,759,447

tion are given. * Prior to January 1951, statistics were given on the basis of total weight. ‡ Includes data for spreader and calendering-type resins. § Includes data for acrylic, polyethylene, nylon, and others. ▷ Includes data for epichlorohydrin, acrylic, polyester, silicone, and other protective coating resins. ‖ Includes data for acrylic, rosin modifications, nylon, silicone, and other plastics and resins for miscellaneous uses.

better PLASTIC PRODUCTS
Begin with
better HEATING UNITS



WATLOW NARROW BANDED HEATING UNITS

EFFICIENT HEAT TRANSFER . . . High heat concentration of 35 to 45 watts/sq. in. Compact, thin, light-weight construction permits closer temperature regulation; eliminates costly temperature lag. Each unit is 1½" wide.

FEWER BURNOUTS . . . High dielectric strength means less cross-section of insulation—resulting in shorter path of heat, lower internal operating temperature, longer life.

QUICK, LOW-COST REPLACEMENTS . . . Easily replaced one unit at a time . . . with only fractional heat loss.

BETTER FITTING UNITS . . . Relatively low expanding metal band keeps unit firmly clamped to surface at all temperatures for steady, constant heat.

SEND for Watlow Catalog—gives valuable heating information on Strip, Band, Cartridge, Immersion Heaters.

SPECIALISTS IN ELECTRIC HEATING UNITS
WATLOW
ELECTRIC MANUFACTURING COMPANY
1328 N. 23d St. St. Louis 6, Mo.

Every day more and more people say: we like to do business with WOLOCH

We Buy, Sell and Reprocess
All Types of Plastics
virgin and scrap

POLYSTYRENE	POLYETHYLENE
ACETATE	VINYL
ACRYLIC	BUTYRAL

GEORGE WOLOCH CO.
61 Broadway, N. Y. 6, N. Y.
HAnover 2-1173-4-5

have you discovered FORMICA laminated plastics?

It's the toughest, strongest, most durable material you can buy in its weight class.

It's half the weight of aluminum.

Its strength-weight ratio compares favorably with steel.

Meets or exceeds the standards set by N. E. M. A.

Productive Formica comes in sheets,

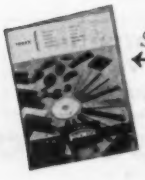
tubes,

rods,

and special postformed and molded forms. It can be punched, turned, milled, drilled, threaded and stamped on machinery already in your metalworking or woodworking shop.

Productive Formica is noted for increasing sales volume and for lowering manufacturing costs.

It can do as well for you . . . because it's a versatile material of many uses . . . excellent for electrical, chemical or mechanical applications. Why not see for yourself . . .



Send today for your free 16-page illustrated catalog.

THE FORMICA CO.
4531 SPRING GROVE AVENUE
CINCINNATI 32, OHIO

Productive FORMICA at Work in Industry

Glass-Plastic

THE possibility of flying glass resulting from explosive forces is virtually eliminated by a glass-plastic laminate, the Flexseal Bomb Glass, introduced by Pittsburgh Plate Glass Co., Pittsburgh, Pa. This addition to civilian defense weapons is constructed so that a bomb blast or pressure wave will break it into four triangular hinged sections, instead of blowing in the whole window and sending glass fragments flying into the room.

Flexseal glass consists of an outer layer of sheet glass, a middle layer of polyvinyl butyral, and an inner layer made up of four triangularly shaped pieces of glass. The plastic is scored to correspond with the X pattern of the inner glass.

The polyvinyl membrane, which extends about ⅛ in. beyond the edge of the glass proper and into the window frame, is held firmly to the frame by retainer strips. Screws passed through the strips bolt the plastic to the frame, so that the middle layer acts as a hinge for the whole "sandwich."

Thus, in the event of a bomb blast or an abnormal pressure wave, the window will open automatically by swinging inward in four segments as the outer glass breaks.

An additional safety feature is offered by the ability of the vinyl to stretch up to 400% of its unstressed length and to return to within 0.5% without rupture.

After the explosion, the four triangular sections can be returned to position and retained there by a bolt, masking tape, a wad of gum, or any other simple method. Crevices are sealed with any handy adhesive, and the temporarily restored window affords necessary protection until it can be permanently reglazed. The simplicity of restoring closure is important because replacement glass would be difficult to obtain at the scene of disaster.

A variety of sizes is used for the three layers, ranging from double strength to ¼-in. plate for the glass, and from 0.020 to 0.080 in. for the plastic—usually with built-up edges. When installing the laminate, the glass itself does not quite fill the light opening; the bottom of it rests on top of the channel into which the extended plastic edge is set.

Safety Window

Photos courtesy Pittsburgh Plate Glass Co.
Bomb glass (top, before explosion) is made of outer glass layer, middle layer of polyvinyl butyral, inner glass layer. After blast breaks outer glass, matching triangular sections of center and inner layers swing inward on hinges formed by extension of plastic (center). Window can be temporarily fixed by repositioning and sealing segments

FORMICA IS GREAT FOR GUNS!

Formica had the answer for the men who engineered the tank-blasting bazooka ... and for those who designed the Aircomatic welding gun to tame tough metals.

FORMICA WAS CHOSEN FOR high heat resistance, dimensional stability, low moisture absorption and arc resistance.

YOUR JOB MAY CALL FOR still other properties, but Formica's range of 50 standard grades meets every requirement. And Formica is available in sheets, tubes and rods, postformed and molded forms. Send today for new Formica catalog with complete details.

THE FORMICA CO.,
4531 Spring Grove Ave., Cincinnati 32, Ohio

Productive
FORMICA
Reg. U. S. Pat. Off.
at Work in Industry

BETTER MOLDS FOR PLASTICS...

GUARANTEE RESULTS

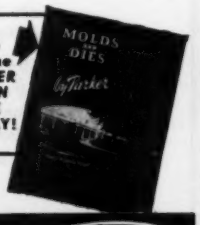
Efficiency and economy result when skilled craftsmen, operating the latest and best machinery available tackle a PARKER mold.

. . . AND THEY COST LESS TOO!

A mold for plastic that produces a product that needs polishing, or a product with excessive flash that needs trimming, or plastic parts that lack uniformity and do not fit properly into assemblies, is an EXPENSIVE mold.

An investment in expert design technique, experience and craftsmanship, when buying a mold for plastic, not only saves molding time, production headaches, but pays off in quality molded products. A guarantee of uniformity and accuracy of the finished molded product is built into every Parker mold. Be sure that your plastic products come out "Clean as a Whistle". Investigate Parker's mold making facilities. Remember a *better* mold for plastics guarantees results and *costs less* too!

Write for the PARKER GREEN BOOK TODAY!



THE PARKER STAMP WORKS, INC.
PLASTIC MOLD DIVISION
by Parker
FRANKLIN AVENUE • HARTFORD, CONNECTICUT

Garden rake molded of butyrate is lighter than conventional metal tool

Butyrate Rake

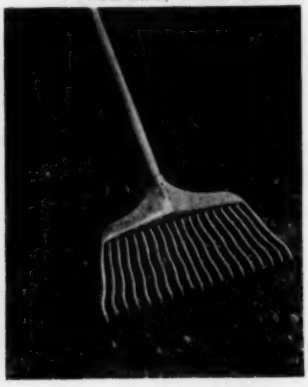
LATEST proof of progress in the Australian plastics industry is offered by a garden rake ingeniously molded of cellulose acetate butyrate. The producer, A.C.I. Plastics, Pty., Ltd., Spotswood, W. 14, Victoria, believes its product to be the only plastic rake manufactured in the world.

Called Garnite, the rake is made of Tenite II furnished by Tennessee Eastman Co. By molding the body of butyrate, the weight of the rake is much less than that of conventional metal gardening rakes. The rake has 19 prongs, each of which has a slightly irregular profile ending in a claw-like tip. This construction has two advantages: it increases the strength of the prongs; and it makes possible a more thorough job of raking and gathering leaves.

The handle of the rake is a wooden shaft that slips into a ferrule molded as part of the rake.

Irregular prongs with claw-like tips make butyrate rake an efficient tool

Photos courtesy Tennessee Eastman Co.



IDEAS *in the making*

ARALDITE* *Bonding, Casting, Coating Resins and* **ARDUX*** *Bonding Resins developed by Ciba Research are simplifying manufacturing methods, improving product efficiency, and opening new fields of product development. Some important new and typical "in use" examples are shown and described here.*

PERMANENT PROTECTION

against destructive action of fatty acids on aluminum walls lengthens service life of new cream whipping dispenser.

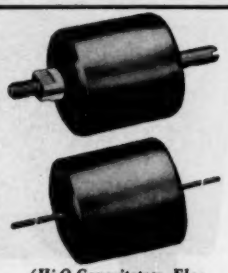
(Kidde Manufacturing Company)

A big problem simply remedied at low cost. The Araldite coating resin used here sets at room temperature, is completely tasteless, odorless and inert, and is characterized by excellent wetting and covering power on metals.

Editor's Note: Araldite coating resins are also being successfully applied as liners for cans and collapsible tubes.

IMPROVED EFFICIENCY

for high voltage capacitators.



(Hi-Q Capacitators, Electrical Reactance Corp.)

Piercing pressure of dielectric material increased greatly by jacketing procedure using an ARALDITE Casting Resin that provides high dielectric strength, arc and humidity resistance, affinity for metals. Transformers weighing many pounds have been potted in Araldite Casting Resins.

Editor's Note: Among other fields of Araldite Casting Resin use . . . valves and fittings of exceptional corrosion resistance and dimensional stability. Sets without evolution of volatile materials. Requires no pressure.

DURABLY BONDS

metals, (ferrous and non-ferrous) to rubber, (natural and synthetic) . . . also wood, thermo-setting plastics, to themselves or to each other.

ARDUX Resins provide much sought properties . . . overcome stress failure and effects of shock loading . . . give high strength at high temperatures.

(Above) Ardux Resin bonds brake linings to brake shoes and clutch plates. Eliminates rivets.

(Right) Rubber tubing bonded with Ardux Resin to aluminum alloy capping strip. (The De Havilland Aircraft Co., Ltd.)

IDEA GENERATORS!

Newest ARALDITE and ARDUX Resins Technical Bulletins are now ready, giving complete technical data on physical properties and recommended procedures. Profusely illustrated with application photographs and diagrams.

Send for your copies . . .

(OR WRITE IN DETAIL ON YOUR LETTERHEAD)

Ciba *Plastics*

★ BONDING ★ CASTING ★ COATING RESINS

*Reg. U. S. Pat. Off.

M.P.

CIBA COMPANY INC., PLASTICS DIVISION
627 Greenwich St., New York 14, N. Y.

(In Canada: Ciba Co. Ltd., Ciba Bldg., Montreal)

Please send me Ciba Plastics Technical Bulletins for
BONDING ☐ CASTING ☐ COATING ☐

*Name*_____

*Company*_____ *Title*_____

*Address*_____

Cold Mold
Plunger
Compression
Injection
Transfer

only

PLASTIC MOLDING CORP.
offers

5 all

major molding methods

Our many customers find it a distinct comfort to know that Plastic Molding Corp. molds by *all five major molding methods.*

To them this means we always consider their molding assignments in terms of *what is best,* not in terms of *what equipment we have* . . . because we have every type of press equipment for molding plastics . . . the *one* molder in New England who offers you *all five major molding methods.*

PLASTIC MOLDING CORPORATION
SANDY HOOK, CONNECTICUT

Molders of Plastics for Over a Quarter Century

Transparent Engine in Toy Car

EVERY child who has wondered how an internal combustion engine works will be delighted with a toy car molded of cellulose acetate which has a transparent "block" and "pan" on its four-cylinder engine, enabling the inquisitive youngster to observe the moving parts in operation.

Called the Hot-See-Rod, the toy has 35 plastic parts. Only the four rubber tires and the metal axles and motor are not plastic. Nosco Plastic, Erie, Pa., molds the plastic components in three molds: one which produces the clear chassis and motor block; one for the colored pistons; and a third which molds the rest of the colored parts.

The car has a strong inertia motor geared to the rear wheels. The crankshaft which moves the pistons is geared to the front wheels. When the car moves, the crankshaft turns, the pistons move up and down, and the fan and gears turn.

The body on the rear of the car can be removed by pulling off the rear license plate which force fits into holes in the rear of the car. Thus the operation of the inertia motor can be seen through the transparent chassis.

Transparent acetate block and pan permit view of operation of engine parts

Acetate car includes 35 plastic parts. Rear body unit is removed by pulling off rear license plate. Three separate molds are used to make components of educational toy

because COLOR IS A FACTOR

Temperature is vitally important in plastic molding. Proper molding temperature assures not only true colors, but accuracy of form and maximum strength as well. The Cambridge Mold Pyrometer offers a quick, simple and accurate means of checking mold cavities temperatures. It is a rugged instrument built for plant use . . . so easy to use that molders will use it.

Combination and Single Purpose Instruments

Send for bulletin 194—S

Cambridge Instrument Co., Inc.
3711 Grand Central Terminal N.Y. 7, N.Y.

CAMBRIDGE
MOLD • NEEDLE • ROLL
PYROMETERS

Bulletin 194—S gives details of these instruments. They help save money and make better plastics.

AT THE RIGHT PLACE—AT THE RIGHT TIME

WITH THE BARKER & DAVIS AUTOMATIC ROTARY CUT-OFF MACHINE

It is the first of its kind used in plastic and rubber extruding machines. Multiple rotary blades cut through the stock and position for the next cut automatically. It is controlled by timer and solenoid activated single revolution clutch—cuts sheets and tubes cleanly and accurately. It will take any desired length up to 30 ft. It is claimed by users that it speeds up production, eliminating one operator and quickly pays for itself.

The timer or cut-off may be purchased separately if desired. Has ½ H.P. motor—weighs 325 lbs.—Timer weight, 50 lbs.

Write for bulletin sheet.

BARKER-DAVIS MACHINE CO., INC.
LEOMINSTER, MASS.

SPOTLIGHT ON

QUALITY!

Experience has established the merits of Sebacic Acid Esters as plasticizers. Their outstanding properties are:

High efficiency
High heat resistance
Low temperature flexibility
Water resistance
Resistance to sunlight

For sebacates of highest quality, Ask Hardesty.

THE KEY TO HARCHEM BETTER PLASTICS

Canadian Distributors: W. C. Hardesty Co. of Canada Ltd., 979 Lillooet Road, New Toronto, Canada

For information and samples, write

HARDESTY
CHEMICAL COMPANY INC.
41 EAST 42nd ST. NEW YORK 17, N. Y.

MANUFACTURERS OF SEBACIC ACID

M

COMPRESSION
INJECTION
EXTRUSION
FABRICATION

MICHIGAN MOLDED PLASTICS, INC.

Plant and General Offices: DEXTER, MICHIGAN

Sales Offices:
DETROIT
BUFFALO
ELYRIA, OHIO
PHILADELPHIA
MINNEAPOLIS
ST. LOUIS
MILWAUKEE
CHICAGO
MOLINE, ILL.
SOUTH BEND
LANSING

TAKE YOUR PICK

they're free

Booklets and folders containing vital information on

machinery **equipment**
supplies **services**

are listed in the Manufacturer's Literature Page of this issue.

If you will merely circle the numbers corresponding to the items you want and mail the reply card, the literature you select will be sent *free*.

There are forty-four items listed this month—something to interest everyone. The Manufacturer's Literature Page is found on pages 177,178. Turn to it now.

a service of

MODERN PLASTICS

A Breskin Publication

575 Madison Avenue New York 22, N. Y.

New Resins Plant in South

OPERATIONS started on October 27 in the new and modern resins plant just completed at Thomasville, N. C., by Catalin Corp. of America, 1 Park Ave., New York, N. Y.

With plants at Fords, N. J., and Calumet City, Ill., serving the East and Midwest, Catalin's new unit completes another link in a chain of plants planned by the corporation to further improve delivery service of its materials to all industrial sections of the country. Catalin's plant at Calumet City, officially opened a little more than a year ago, has been consistently expanding its capacity to meet demand.

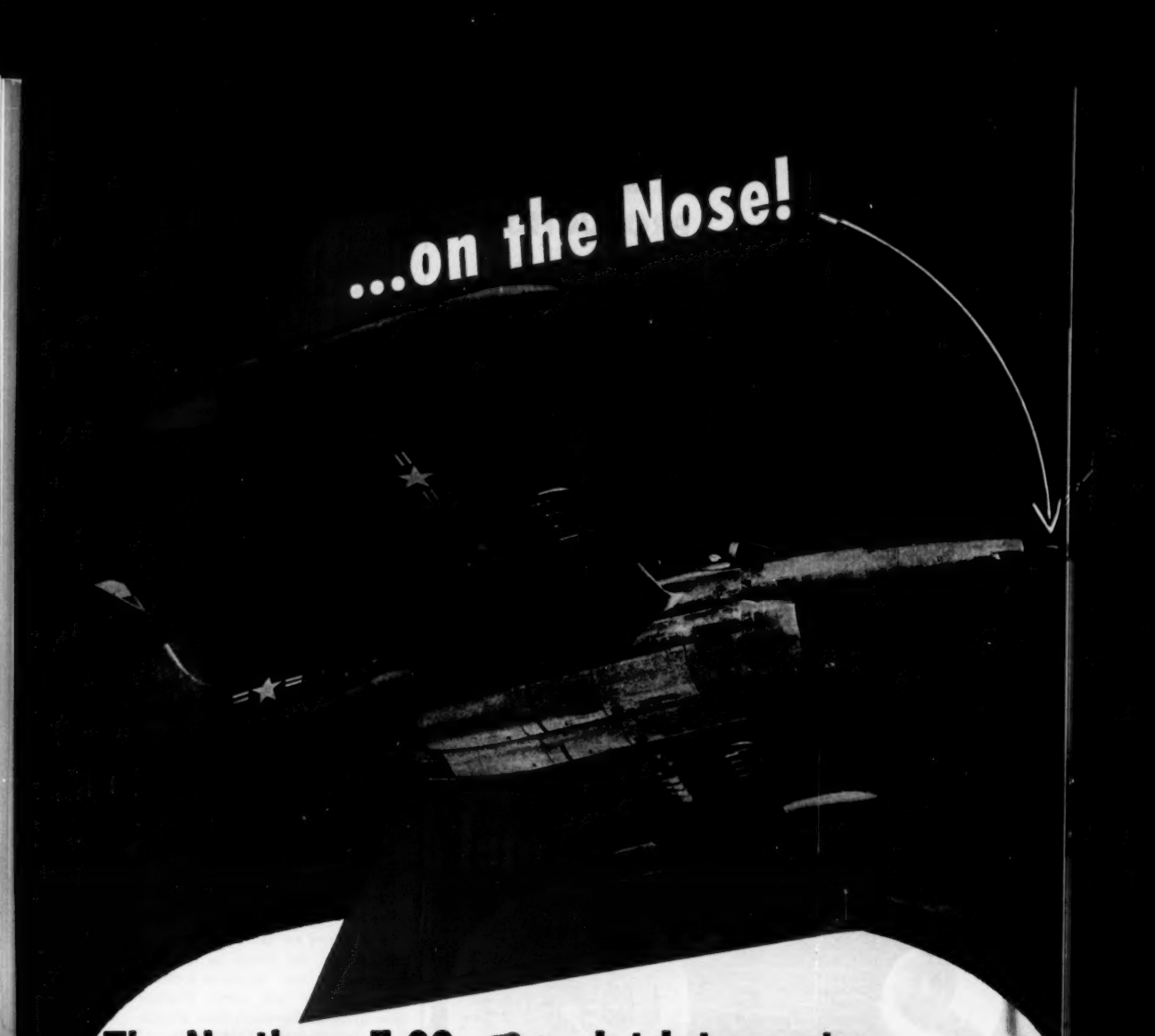
Catalin's new plant is located in the very heart of the furniture and textile manufacturing area of the South. It will supply finishes of rayon and rayon blended fabrics with low and medium polymer liquid resins and cremes for developing crease-resistant finishes as well as for modifying the hand of fabrics and improving their dimensional stability.

This new plant will also furnish the furniture and plywood industries of the South with a complete range of urea, phenolic, and resorcinol resin glues in liquid and powder form, for all types of hot or cold press applications.

Resin customers of Catalin such as foundries, laminators, fibrous glass and rock wool producers, paper mills, etc., within the same area will also be served from the new plant location.

It has also been announced that a contract for expansion of the Catalin phenol-formaldehyde resin facilities located at Fords, N. J., has recently been awarded to Chemical Plants Div., Blaw-Knox Co. Engineers of the construction company are already on the job and the plant is expected to go into increased production about July 1952.

New Catalin plant in North Carolina



The Northrop F-89 *Twin* Jet Interceptor is equipped with ZENALOY* parts — by *Zenith*

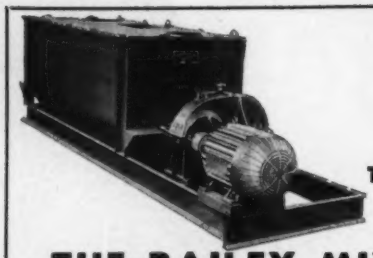
The U. S. Air Force's Northrop Scorpion all-weather, night-and-day interceptor, with its sextet of 20 mm. cannon in the nose section and 16 five-in. high velocity rockets under its wings can give a terrific account of itself in actual combat.

ZENITH's contribution of the nose assembly to this formidable "Scorpion that carries its sting in its nose," is another example of the effective combination of engineering plus production efficiency.

OTHER AIRCRAFT EQUIPPED BY ZENITH: Aeronca • Bell • Boeing • Cessna • Chance-Vought Consolidated-Vultee • Curtiss-Wright • Douglas • Fairchild • Lockheed Martin • McDonnell • North American • Republic

R.P.* REINFORCED FIBERGLAS PLASTICS

ZENITH PLASTICS CO. • Gardena, California



DOUBLE PRODUCTION!

That's the news headline made possible by

THE BAILEY MIXER
IT'S REVOLUTIONARY

NOW YOU CAN PRE-MIX BEFORE LOADING INTO YOUR BANBURY OR CALENDER—SHORTENING CYCLE-TIME—INCREASING PRODUCTION—REDUCING COSTS—BOOSTING EFFICIENCY ALL ALONG THE LINE.

THE BAILEY MIXER IS BETTER BECAUSE—

it is specifically adapted to plastics! It's over-all scientific construction and numerous new and improved precision details place it in a class by itself. More efficient, easier-cleaning—empties quicker and more thoroughly too—more basic Body Support—over-all trouble free operation.

The mixing element is new—increased mixing intensity, shortens mixing time and operates on less power. All this means increased production—more efficiency—PROFITS.

Companies like MONSANTO, AMERICAN CYANAMID, BORDEN, ROSS & ROBERTS, RESILOID, IDEAL PLASTICS CORP., etc., all use Bailey Mixers!

Tell us your mixing problems and we'll solve them. For complete details write—

R. N. BAILEY & CO., INC. 11 W. 42nd St., New York 18, N.Y.

Thermel
Aluminum permold "Thermaheater" (underside) showing boss for thermostat mounting etc. Executed for manufacturer of laboratory hot plates — 425 watts.
Aluminum cast-in "Thermaheater" for out-of-doors application provided with water-tight terminal housing — 55 watts.
Aluminum "Thermaheater" plate for magnetic stirrer with housing for terminals and thermostat, cast-on — 750 watts.
Aluminum bronze quality "Thermaheater" to be applied on hex-nut of nozzle. For nylon injection moulding to overcome radiation losses — 450 watts.
offers
IN QUALITY
CAST-IN SOLUTIONS
to Special Electric Spot-Heat Problems
Thermel specializes in engineering and execution of special electrical spot-heat problems.
Thermel, inc.
3441 W. Lake Street Chicago 24, Illinois

Encyclopedia Addenda

Unfortunately omitted from the directory section of the *1951 Modern Plastics Encyclopedia and Engineer's Handbook* were listings for the two following firms:

Presco Plastics, Inc.
277 E. Erie St.
Milwaukee 1, Wis.
Mr. E. K. Schroeter, Pres.

It is stated by Mr. Schroeter that his firm should be listed as Custom injection molders; Fabricators of thermoplastics; Plastic sheet processors; Laminators, both industrial and decorative; Manufacturers of vinyl film and sheeting.

Equipment listed includes 4-, 9-, and 16-oz. injection machines and a tool room.

Mr. Schroeter also states that his firm renders the following services on a custom basis: Gold leaf stamping, silk screening and spraying; Deep drawing of thermoplastics; Die cutting and embossing; Finishing and assembling of molded parts; Heat sealing of film and sheeting; Perforating of sheeting; Model making; Mold making; Printing of rigid plastic sheets.

R. W. Kerr Plastic Co.
220 S. Burlington Ave.
Hastings, Nebr.
R. W. Kerr, Pres. & Treas.
Charlotte J. Kerr, Vice Pres. & Secy.

It is stated by Mr. Kerr that his firm should be listed as Custom compression and injection molders operating own tool room; Custom fabricators of thermoplastics; Plastic sheet processors; Fabricators of laminates and vulcanized fiber; Laminators, both industrial and decorative.

According to Mr. Kerr, this firm renders the following services on a custom basis: Gold leaf stamping; Deep drawing of thermoplastics; Die cutting; Heat sealing.

Encyclopedia Erratum

On page 358 of the *1951 Modern Plastics Encyclopedia and Engineer's Handbook*, a phenolic laminate reinforced with an unwoven cotton mat, made by The Richardson Co., Melrose Park, Ill., was listed as Insurok Grade T-15. The correct designation for this grade is T-815.

CONTINENTAL INC. ★ SCREW COMPANY ★ 1904

You can count on Continental

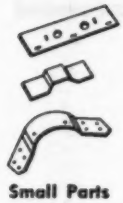
CONTINENTAL SCREW COMPANY
New Bedford, Mass.

Manufacturers of famous HOLTITE-Phillips and Slotted Head Screws and Bolts and Allied Fastenings, both Special and Standard

HOLTITE *Engineered* FASTENINGS

Your product may be one of many made better with—

Fiber Glass Reinforced Plastics



Small Parts

★ Custom Molded Parts up to 90" long, 46" wide, 30" deep.

★ Flat Sheets up to 36" x 72".

★ Channel Sections 90" long.

★ Small Parts punched from Flat Sheets, Channels and Angles.

Chair Backs

Fiber Glass Reinforced Plastics have the highest strength-weight ratio of any material known. They will withstand temperatures from —60° F. to 350° F., will not warp or set and are impervious to moisture, acids, alkalis and most solvents. Smooth, excellent surfaces in a wide variety of molded shapes and sizes make fiber glass reinforced plastics worth investigating for your products.

Beverage Cooler Lids

Vacuum Cleaner Parts

Suitcases

Plants at Ashtabula, Ohio and Chicago, Ill.
Sales, Engineering and General Offices at Ashtabula

MOLDED RESIN FIBER CO.

ASHTABULA, OHIO

World's Largest Producer of Fiber Glass Reinforced Plastics

Photo courtesy Plax Corp.

Dispenser can be carried in purse with no danger of liquid contents spilling

Polyethylene Dispensing Tube

AN unbreakable polyethylene dispenser tube—claimed to be the smallest squeezable polyethylene container yet molded—has been developed by Plax Corp., Hartford, Conn., as a pocket package for small or emergency quantities of medicine, cosmetics, or other products. The dispenser has a capacity of 4 cc., or ⅛ oz., and an over-all length of about 2½ inches.

The miniature dispenser tube has a tapered tip which permits, for example, insertion into the nostrils or into a small abrasion. It is available with or without a polyethylene closure which fits snugly over the threadless, tapered end.

The container does not drip when it dispenses liquids because the flexibility of the polyethylene creates a suction when the tube is released after squeezing. Thus, it may be safely carried in the pocket, handbag, or medicine kit without danger of breaking or leaking. In addition, the contents of the tube are visible at all times.

Because the unit can be filled with conventional filling equipment, it is supplied to packagers of cosmetics, medicine, and specialty products with the end either sealed or open. A small ring on the closure, which attaches the dispenser tube to an object, is also optional.

HELPFUL FREE LITERATURE

EQUIPMENT • SUPPLIES • SERVICE

The literature and samples described here contain valuable data that will help increase the operating efficiency of your business.

After selecting the items you want merely circle the corresponding numbers on the post card, fill in the information requested and mail.

INORGANIC COLOR PIGMENTS. Sample chart shows many of the colors in which Ferro inorganic pigments are available. Used for coloring thermoplastic resins and other products. Ferro Corp. (B-50)

DRY PROCESS TUMBLING BARRELS. Specification sheet illustrates single tumbler-type barrels for cutting down, deburring, definning, dry burnishing, and polishing plastic parts. Data on selection of compounds for specific jobs. Tumb-L-Matic, Inc. (B-51)

MAKING "VUEPAK" CONTAINERS. Folder with directions for fabricating square and round packages from Vuepak cellulose acetate transparent packaging material. Monsanto Chemical Co. (B-52)

MULTIPLEX DIRECT FLOW PUMPS. Data and specification sheet on Aldrich 5-in. stroke direct flow pumps for applications requiring central hydraulic pressure systems. Includes pump selection chart. The Aldrich Pump Co. (B-53)

NEW DEVELOPMENTS. Plastics bulletin shows a number of interesting new uses of Du Pont Polythene, nylon, and other plastics. E. I. du Pont de Nemours & Co., Inc. (B-54)

STANDARDS FOR DIE CASTING MOLDS. Illustrations, specifications, diagrams, prices, and other authoritative information on standards for die casting molds are presented. Detroit Mold Engineering Co. (B-55)

CATALYTIC SYSTEMS FOR "PARAPLEX 'P'" RESINS. Description of catalytic systems designed to decrease shrinkage, eliminate cracks, and reduce volatilization of styrene in low-pressure castings. Rohm & Haas Co. (B-56)

PLASTICS EXTRUDER. Folder explains the features and specifications of a 1-in. experimental extruder—for thermoplastic materials—manufactured by Francis Shaw & Co. Ltd. (B-57)

PLASTIC GLAZING. Brochure illustrates and describes various uses of Vimlite, a Celanese plastic glazing, for use in poultry houses, plants, and as insulation, in partitions, etc. Sample is included. Celanese Corp. of America. (B-58)

CHROMALOX NEWS. A series of short case histories shows how various companies are using Chromalox heaters as efficient sources of electric heat. Edwin L. Wiegand Co. (B-59)

WATER SOLUBLE RESIN POLYMERS. Technical data on Aquamers, which are used as thickeners for natural and synthetic latex, in textile and paper finishes, and in forming flexible heat resistant films. American Polymer Corp. (B-60)

HYDROLAIRS. Advantages, specifications, features and other information on Elmes Hydrolairs, power-operated production presses that have neither motors nor pumps. Elmes Engineering Div., American Steel Foundries. (B-61)

MASTER TOOLMAKER. Description and specifications of a highly adjustable machine for wide variety of intricate tool making assignments. J. Arthur Deakin & Son. (B-62)

HYCAR-PHENOLIC COMPOUNDS. Folder tells about a new series of thermosetting compounds, filled with various materials which give the compounds good moldability, heat resistance, and excellent shock resistance. General Electric. (B-63)

PLASTOLEIN PRODUCTS. Contains properties and characteristics of all Emery plasticizers, special fatty acids for alkyds and the new Emery M-461-R Dimer Acid, and its application in the surface coating field. Emery Industries, Inc. (B-64)

LABEL APPLICATOR. Bulletin describes an electric labeler which provides fast, automatic dispensing of Kum-Kleen labels for application to various surfaces. Avery Adhesive Label Corp. (B-65)

"FLEXOL" PLASTICIZER. Technical information bulletin includes tentative specifications and physical properties of Flexol B-400, a new plasticizer that is compatible with nitro-cellulose and similar to castor oil. Carbide and Carbon Chemicals Corp., Unit of Union Carbide and Carbon Corp. (B-66)

"FORMICA" AT WORK. Catalog on industrial grades of Formica highlights comparator chart on major characteristics of 50 separate grades. The Formica Co. (B-67)

SAFETY AIR HOIST. Catalog insert explains the use of an air hoist which will not drop its load even if the air supply fails. Specifications and prices included. Miller Motor Co. (B-68)

"PLIOLITE" FOR EXTERIOR PAINTS. Technical bulletin gives formulations for production of deep-tone exterior masonry paints using Pliolite S-5, high styrene copolymer resin. Chemical Div., The Goodyear Tire & Rubber Company, Inc. (B-69)

ILLUMINATED PLASTIC DECORATIONS. A selection of illuminated plastic advertising signs and displays are illustrated. Descriptions of appearance and operation are included. General Plastics Corp. (B-70)

CARBIDE MILLS. Bulletin explains the advantages of Severance Carbo-Mills for removing gates and fins, for maintenance of molds and dies and other grinding assignments. Shows various shapes available and lists prices. Severance Tool Industries, Inc. (B-71)

Fill out and mail this card now

MODERN PLASTICS

Manufacturers' Literature Service

I am interested in the following items:

B-50	B-51	B-52	B-53	B-54	B-55	B-56	B-57	B-58	B-59	B-60
B-61	B-62	B-63	B-64	B-65	B-66	B-67	B-68	B-69	B-70	B-71
B-72	B-73	B-74	B-75	B-76	B-77	B-78	B-79	B-80	B-81	B-82
B-83	B-84	B-85	B-86	B-87	B-88	B-89	B-90	B-91	B-92	B-93

If you do not now subscribe to MODERN PLASTICS, but wish to receive the next 12 issues ($5 everywhere), just check here ☐

NAME ..... ***POSITION*** .....

(Please Print Plainly)

COMPANY .....

STREET ..... ***CITY*** ..... ***STATE*** .....

(Not Valid After February 1, 1952)

HELPFUL FREE LITERATURE

EQUIPMENT • SUPPLIES • SERVICE

The literature and samples described here contain valuable data that will help increase the operating efficiency of your business.

After selecting the items you want, merely circle the corresponding numbers on the post card, fill in the information requested, and mail.

ENCLOSED POWER DRIVES. Bulletin shows a number of enclosed electric motors for use where constant normal speed is required. Splash proof, drip proof, and fan cooled models. Sterling Electric Motors. **(B-72)**

CARBON BLACKS FOR RUBBER. Chart classifies various carbon blacks by groups, brand names, and manufacturers. Godfrey L. Cabot, Inc. **(B-73)**

LAMINATED PLASTICS. Illustrated booklet containing a thorough discussion of laminated plastics made with Bakelite phenolic varnishes, their properties, and advantages. Bakelite Co., Div. of Union Carbide and Carbon Corp. **(B-74)**

SELF-TAPPING SCREW DRIVING EQUIPMENT. Folder shows various types of power driving equipment for use with Parker-Kalon self-tapping screws for faster assembly. Parker-Kalon Corp. **(B-75)**

SELF-STIK LABELS. Booklet shows 39 different ways in which Mystik Self-Stik labels may be used to place brand identification, instructions, etc. directly on the product. Chicago Show Printing Co. **(B-76)**

INJECTION MOLDING MACHINES. Collection of eight ad reprints which point out the advantages of Reed-Prentice injection molding machines. Reed-Prentice Corp. **(B-77)**

HERCOCEL MOLDING POWDERS. Data based on A.S.T.M. tests for a number of formulations of Hercocel cellulose acetate and ethyl cellulose molding powders. Includes data on flame resistant, general purpose, heat resistant, and high impact types. Hercules Powder Co. **(B-78)**

VALVES. Folder showing a large variety of Atlas valves with applications in hydraulic equipment, steam and water lines, and similar uses. Atlas Valve Co. **(B-79)**

SUB-CONTRACTING FACILITIES. Booklet listing facilities for prime and sub-contracting of military orders which use plastic materials. Rogers Corp. **(B-80)**

"SOLKA-FLOC." Folder covering the characteristics of purified cellulose flock for extending and improving the characteristics of thermosetting and thermoplastic resins. Sample included. Brown Co. **(B-81)**

INJECTION MOLDING MACHINE. Specification sheet on a thermoplastic injection molding machine of 8-oz. capacity. R. H. Windsor, Ltd. **(B-82)**

BAND SAW GUIDE. Described in this folder is the Carter Micro-Precision Guide for supporting band saw blades to permit longer life and more efficient operation. Carter Products Co., Inc. **(B-83)**

ETHOXYLINE RESINS. General data on Araldite ethoxyline resins for bonding metals, ceramics, glass, and plastics and for corrosion resistant potted, electrical, and other castings. Ciba Co. Inc. **(B-84)**

"STAFLEX KA." Description of a plasticizer which is designed to incorporate some of the advantages of the high-molecular-weight polymerics without their disadvantages. Deecy Products Co. **(B-85)**

MOLDING FACILITIES. Folder traces the history and illustrates the facilities of one of the oldest plastics molders in the country. Auburn Button Works, Inc. **(B-86)**

POLYVINYL MATERIALS. Manual on Geon materials, their properties, compounding process, and the products which can be made from them. B. F. Goodrich Chemical Co. **(B-87)**

"BOLTARON" MOLDING MATERIAL. Leaflet explains the characteristics of Boltaron, a thermosetting material of almost unlimited formability and high impact resistance. Bolta Products Sales Inc. **(B-88)**

"PERSPEX" ACRYLIC MATERIALS. Book dealing with the history, characteristics, forms, working, shaping, shock molding, cementing, dyeing, finishing, properties, etc., of Perspex acrylic materials. Imperial Chemical Industries Ltd. **(B-89)**

PLASTICS FABRICATION. Folder suggests typical products which can be made with formed and fabricated Royalite, Plexiglas, and Lucite. Regal Plastic Co. **(B-90)**

WORK GLOVES. Descriptive folder on heavy-duty, light-duty, and gauntlet-style heat-resistant work gloves made of flexible flame-resistant cloth. C. Walker Jones Co. **(B-91)**

CONTINUOUS AUTOMATIC PROCESSING EQUIPMENT. Reprint discusses web and strand coating systems with particular attention to machine design. Shows typical arrangement of component machines. Industrial Ovens, Inc. **(B-92)**

PLASTICS INJECTION PRESS. Specification sheet and description of a fast-cycling 2-oz. capacity injection press. The Van Dorn Iron Works Co. **(B-93)**

Fill out and mail this card now

Postage Will Be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

First Class Permit No. 2656 (Sec. 34.9, P.L. & R.), New York, N.Y.

MODERN PLASTICS

575 Madison Avenue

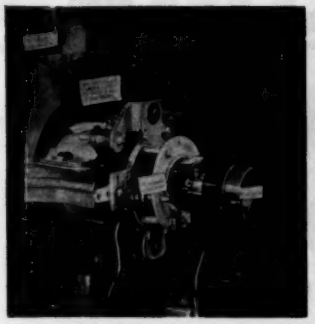
NEW YORK 22, N. Y.

T. V. Tube Spool

ASSEMBLY operations of Radio Corp. of America's kinescope, or cathode-ray television picture tube, are appreciably reduced by molding one important component—the yoke spool—of Bakelite phenolic. Formerly, this component was made of impregnated cardboard and was assembled from 10 separate pieces which were stapled together.

The yoke—consisting of a pair of horizontal and a pair of vertical deflecting coils, plus a magnetic core—is located at the neck of the picture tube. Its function is to deflect the electronic beam shot out by a "gun" in the socket end of the picture tube, and guide it over the screen face of the tube. The stream of electrons excites the sensitive phosphers, with which the inside surface of the screen face is coated, so that they radiate visible light. This creates the video picture.

The coil and core elements of the yoke must be held in exact relationship to each other to keep the video picture free from distortions, exaggerations, and spurious lines. The phenolic yoke spool is able to meet this critical dimensional requirement since, in addition to its very thin walls, it possesses at the same time good dimensional stability and will not warp. The phenolic also provides the insulation necessary to withstand high voltage.

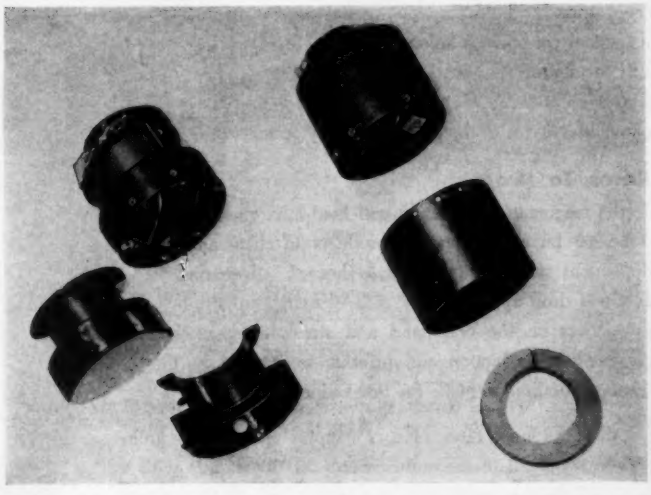


Phenolic yoke spool in position at the neck of the cathode-ray picture tube

The new yoke spool is molded in two halves with interlocking projections, permitting it to be assembled over the coils; the core is on the outside. This spool design permits the coils to be positioned as close as possible over the neck of the kinescope, thus giving the magnetic fields which they generate the greatest effect in deflecting the electron beam.

Molding is done by Mack Molding Co., Inc., Wayne, N.J., and Shaw Insulator Co., Irvington, N.J.

Phenolic spool (left) replaced cardboard spool (right). Latter required many assembly steps involving a number of cardboard washers, only one of which is shown (bottom)



For national defense today Stanley Plastisols and Organosols can be formulated to meet rigid government specifications, with emphasis on low temperature flexibility and fungus resistance.

For competitive selling tomorrow they'll mean greater durability and sales appeal for your product. Write today; take advantage of our years of vinyl experience: Stanley Chemical Co., 71 Berlin St., E. Berlin, Conn.

A SMASH HIT

PLASTICS MERCHANDISING to Become Monthly in January!

Improved Format, Lower Ad Rates Also Scheduled

"If it's made of plastics and it's designed for mass consumption," report manufacturers who have advertised in PLASTICS MERCHANDISING this year, "then there is no doubt that PLASTICS MERCHANDISING is the one best way of selling it to wholesalers and retailers in all types of outlets across the country." That, in substance, has been the reaction of advertisers to the phenomenal pulling power of this new rade magazine since it bgan publication last January.

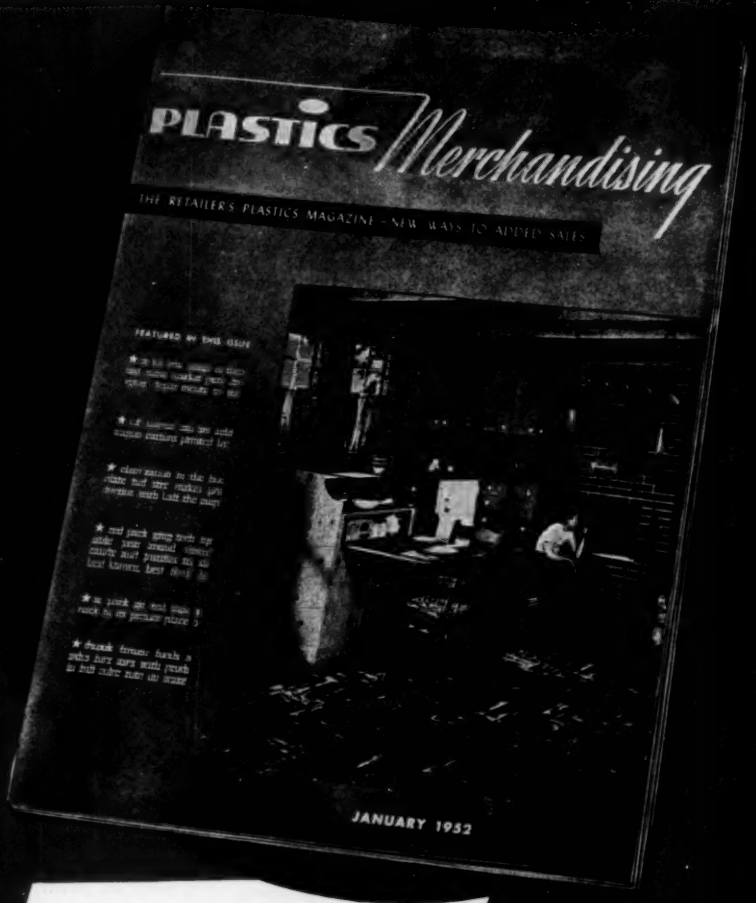
As the direct result of its first year's success and its enthusiastic acceptance by both readers and advertisers, the new magazine will now be able to shift from every-other-month to monthly publication, reduce advertising rates and streamline its present tabloid format. All changes will become effective with the coming January issue.

Ad Rates To Drop

While the magazine's circulation will hold at a guaranteed 50,000 buyers of plastics products in chain and independent stores and wholesale houses, advertising rates will drop approximately 35%! Growing support by advertisers on the one hand and streamlining of the magazine's production and printing operations on the other, combine to make the rate reduction possible.

With the lower rates, plastics manufacturers will be able to reach all of the publication's 50,000 readers with a *full* page advertisement at a cost of only $9.60 per thousand!

ITS FIRST YEAR!



To make PLASTICS MERCHANDISING easier to handle and easier to read, the present large tabloid newspaper format will be abandoned in favor of the standard dimensions (8¼" x 11⅛") now used by its affiliated publications, *Modern Plastics* and *Modern Packaging*.

The lavish use of full color printing that currently distinguishes PLASTICS MERCHANDISING from trade magazines in other fields, will continue to be a feature next year. Since plastics and brilliant color go hand in hand, the editors feel that in many cases only full color reproduction of plastics products can adequately convey to prospective buyers the glamour and sales appeal of available plastics items.

PHENOPREG MATERIALS

for LAMINATING and MOLDING

high pressure • low pressure

PHENOPREG TP—514

A new LOW COST material

- Non-woven cotton mat impregnated with phenolic resin for high and low pressure applications.
- Flat laminates and parts made with this material exhibit a smooth surface, uniformity of strength and good machine ability.
- Excellent mechanical and electrical properties can be obtained when impregnated with special resins.
- Can be hot or cold punched.

We invite your inquiries on this material as well as our many other standard and special grades of PHENOPREG materials. Write today and ask for further information. Sales Engineers available to assist you at all times.

FABRICON PRODUCTS, INC.
PLASTICS DIVISION

Main Office 1721 Pleasant Ave. • River Rouge 18, Mich. • Vinewood 1-8200
Plants: River Rouge, Los Angeles, Philadelphia • Sales Offices: New York, Chicago
Canadian Representative: Plastic Supply Company, Montreal, Toronto

Learn How → FIBERPLAST

The Superior Phenolic Compound for Compression Molding

GIVES YOU MAXIMUM IMPACT STRENGTH PLUS MAXIMUM FLOW!

There's a Fiberplast material that is "just right" for your molding need! Whatever your problem, our laboratory will develop the exact Fiberplast compound that is specifically designed for your particular application. Fiberplast combines selective fibers and phenolics to give you a superior molding compound with these outstanding features:

- Lower molding pressures
- Rapid cure
- Lustrous finish
- Choice of colors
- Heat and moisture resistant
- Special functional capabilities

Let our engineering staff tackle your particular molding problem. Write for full information, material specifications, testing data, or samples, if required.

Plastics Division
INTERNATIONAL TEXTILE CO.
2515 W. 18th Street, Chicago 8, Illinois
Cable Address: Inco

Tableware

(*Continued from pp. 73-6*)

190° F. after exposure to a melamine dish for 10 min.; doesn't know whether or not he gets formaldehyde after 30 min. at 180° F.; and could find no formaldehyde in the water after 60 min. exposure at 200° F.!

The melamine manufacturers have conducted exhaustive tests on the presence of free formaldehyde in liquids after exposure to melamine cups, starting at boiling point and allowing to stand for 3 hours. They found no more than 4 parts per million in the solution under this severely accelerated test. Reputable public health scientists have long since reduced to an absurdity this whole argument of the effect on health of formaldehyde freed from plastics products in hot air and liquids. If there were any scientific validity to the V.C.A. argument, some of our most important foodstuffs would be much more guilty than melamine. According to Ebnig and Schreiber, Biochemische Zeitschrift, 184, 105-B4, the parts per million content of formaldehyde in various foods is as follows:

Milk, fresh	1.0- 1.5
Beef, stewed	2.7
Egg, yolk	5.5
Wheat flour, dough	3.3
Spinach	10 -25
Tomatoes	15.2-16.7
Winter greens, fresh	10.8
Cauliflower, cooked	6.6

But melamine tableware, under arduous punishment for the purpose of freeing formaldehyde, produced only 4 parts per million!

As the volume of plastics increases, as plastics materials become more universally appreciated, as sales of plastics products zoom, more attacks of this type may be expected. The more market losses suffered by the makers of things from traditional material, the more vicious will be the attacks.

The plastics industry can't blame the vitrified china people or any other competitors of plastics for trying to save their markets. The plastics industry can and will reply honestly and most vigorously to any and all such attacks.

The future is not too hard to predict: There aren't many buggy whip manufacturers left!—END

SCS

(*Continued from pp.* 109-14)

ter-soluble materials, and they tolerate relatively large amounts of water-miscible solvents.

Films can be prepared from aqueous solutions of SCS. These films are colorless, transparent, strong, flexible, and highly resistant to the penetration of oils. By employing cross-linking agents of the aldehyde-type, it is possible to make the films water resistant.

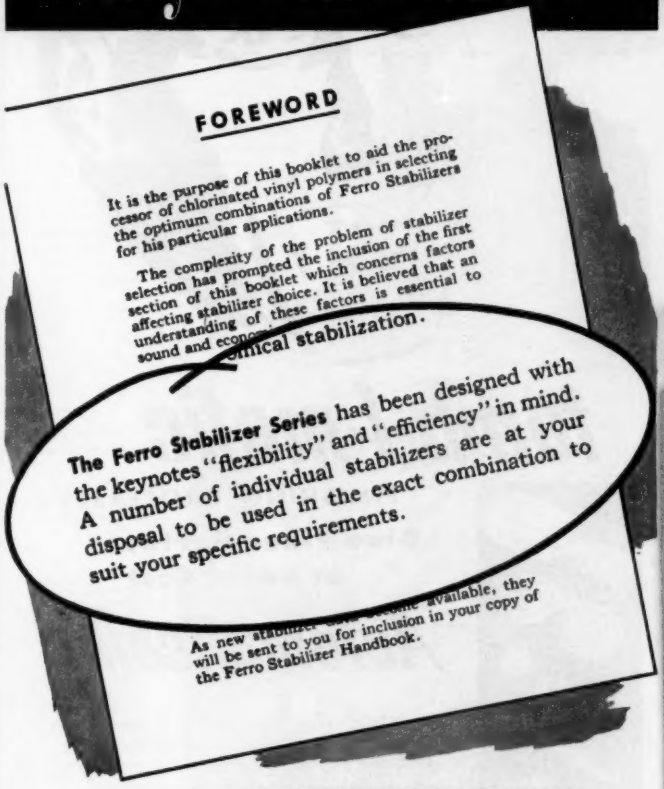
The chemical properties of SCS also have been determined. The product is a non-toxic, neutral sulfate ester salt of cellulose having a sulfur content of 5 to 7 percent. It is stable to heat and to ultra-violet light. It is also stable to storage, both dry and in solution. The low-viscosity type of product is compatible with acids, bases, and the common metallic salts. However, the medium-viscosity type is less compatible with these reagents than the low-viscosity type.

Laboratory tests have indicated that SCS has a variety of applications. Thus, it can be used in detergents, oil well drilling muds, water and emulsion paints, cosmetics, pharmaceuticals, foods, and adhesives. The product also is an excellent creaming agent for natural and synthetic rubber latices. Films of the product can be used in preparing oil-proof paper containers. Since these films are capable of adhering to cellulose, SCS should also be a good sizing agent for paper and for cellulosic fibers and fabrics. There are many other potential uses of SCS which have not been tested in the laboratory, but which become obvious when its properties are studied. In general, this new cellulose derivative should be useful in applications requiring a water-soluble compound possessing suspending, thickening, stabilizing, and film-forming properties.

References

1. American Cyanamid Co., Textile Bulletin 109 (1946).
2. Armstrong, L. J., Am. Dyestuff Reptr. 37, No. 18, 596-602 (1948).
3. Bondy, C., Trans. Faraday Soc. 35, 1093-1108 (1939).
4. Carbide and Carbon Chemicals Co., "Emulsions," 7th ed. (1946).
5. Deutsche Celluloid-Fabrik.,

Vinyl Stabilizers


FOREWORD
It is the purpose of this booklet to aid the processor of chlorinated vinyl polymers in selecting the optimum combinations of Ferro Stabilizers for his particular applications.
The complexity of the problem of stabilizer selection has prompted the inclusion of the first section of this booklet which concerns factors affecting stabilizer choice. It is believed that an understanding of these factors is essential to
The Ferro Stabilizer Series has been designed with the keynotes "flexibility" and "efficiency" in mind. A number of individual stabilizers are at your disposal to be used in the exact combination to suit your specific requirements.
will be sent to you for inclusion in your copy of the Ferro Stabilizer Handbook.

Page 1 from FERRO STABILIZER HANDBOOK.
A new, practical guide to help you solve your problems in vinyl stabilization.

Write for Your Copy, TODAY.

FERRO CHEMICAL CORPORATION
BEDFORD, OHIO

Gentlemen: Please send a free copy of the new FERRO STABILIZER HANDBOOK.

NAME_____

COMPANY_____

STREET_____

CITY_____ STATE_____

tumb-l-matic

FINISHING PROCESSES

Give Finer Surfaces at Least Cost

Automatically

Tumb-L-Matic's "Pushbutton" Processes—equipment, compounds, and techniques—AUTOMATICALLY impart that finer, touch-and-sell finish to your plastic products...at substantial savings. They provide closer control over finishing operations...enhance the saleability of your products through higher-quality definning, cutting, smoothing, and lustering operations. When properly applied, they eliminate costly buffing...free vital manpower for more productive work.

Tumb-L-Matic's extensive line of machinery and compounds, backed by a quarter-century of experience with a wide and broadening range of materials, permit the "tailored" selection of cost-saving *standard* processes to fit your particular products and production layout.

8198

Write and tell us about your product finishing problems...or SEND A SAMPLE FOR COMPLETE ANALYSIS AND RECOMMENDED FINISHING PROCESSES

TUMB-L-MATIC, INC.

FORMERLY LUPOMATIC INDUSTRIES, INC.

4510 BULLARD AVENUE • NEW YORK 70, N. Y.

German Patent 332,203 (1918).

6. Fulnegg, E. G., Stevens, W. H., and Dingler, O., Ber. *61*, 2000-2003 (1928).

7. Hauser, E. A., and Dewey, B. Jr., Ind. Eng. Chem. *33*, 127-130 (1941).

8. Hubert, E. (to F. Bayer and Co.), G.P. 363,192 (1920); J. Soc. Chem. Ind. *42*, 348 (1923).

9. Livingston, H. K., Ind. Eng. Chem. *39*, 550-554 (1947).

10. Stern, A. L., Proc. Chem. Soc. *142*, 186-187 (1894).

11. Suida, W. Monatsh, *26*, 413 (1905).

12. Traube, W., Blazer, B., and Grunert, C., Ber. *61*, 754-767 (1928).

13. Vaughn, T. H., and Smith, C. E., J. Am. Oil Chemists' Soc. *25*, 44-51 (1948).

14. Vaughn, T. H., and Tremain, H. E., Soap Sanit. Chemicals *24*, 37-39, 98 (1948).—END

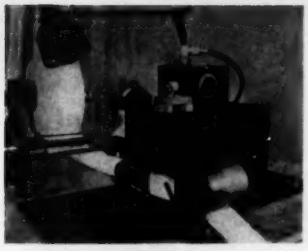
Garan Finish

(*Continued from pp.* 116-18)

ester resin, a series of 20 laminates with 10 commercially available polyester resins was made. The flexural strengths of each laminate were determined both dry and after boiling 2 hr. in water. In every instance, the wet strength was found to be greater than 90% and many were higher than 95% of the dry strength. With five of the resins, several panels were made to establish reproducibility of results. Also, 181 cloth with the Garan finish from six different commercial runs was used to make the laminates. The retention of wet strength was found to be reproducible and independent of the polyester resin used (Table II).

As a further comparison, laminates were made with 181 glass cloth with both the Garan finish and methacrylato chromic chloride finish with five different polyester resins. The laminates were made in a platen press and cured for 1 hr. at 250° F. The resin content of all the panels was within the range 38 ± 2 percent. The laminates were tested in flexure, dry and wet. The wet test used was the 2-hr. boil in water. The Garan finish laminates showed a loss in strength of less than 10%; the methacrylato chromic chloride finish gave a strength loss of 35 to 40% (Table III).—END

special electronic sealers by Mayflower



FOR INSTANCE— Here's an electronic sealer that Mayflower built for automatically making continuous lay-flat tubing from rolled plastic sheeting of almost any gauge or width. Ask for details.

Manufacturers with problems in the production of heat sealed plastics turn to Mayflower for solutions. Mayflower custom designs and builds hi-speed electronic sealers to do jobs no other sealers can. These machines, using famous Mayflower power generators, provide practical methods for mass production.

If you would like to simplify your electronic sealing of plastics and reduce labor and manufacturing costs, ask Mayflower for recommendations.

Mayflower ELECTRONIC DEVICES Inc.

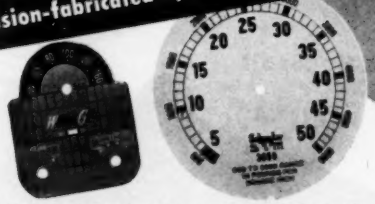
Only Manufacturer of Both Bar and Rotary Electronic Heat Sealers

6014 Hudson Blvd. West New York, N. J.

Forget Metal Shortages!

SWITCH TO **PLASTIC DIALS**

precision-fabricated by SILLCOCKS-MILLER



Don't let metal shortages slow up production. Sillcocks-Miller engineers have the practical answer for you in dials of all types fabricated from plastic.

No matter what your dial requirements may be, it will pay you to consult Sillcocks-Miller. Their experience, facilities and precision techniques will help you solve present metal shortage problems.

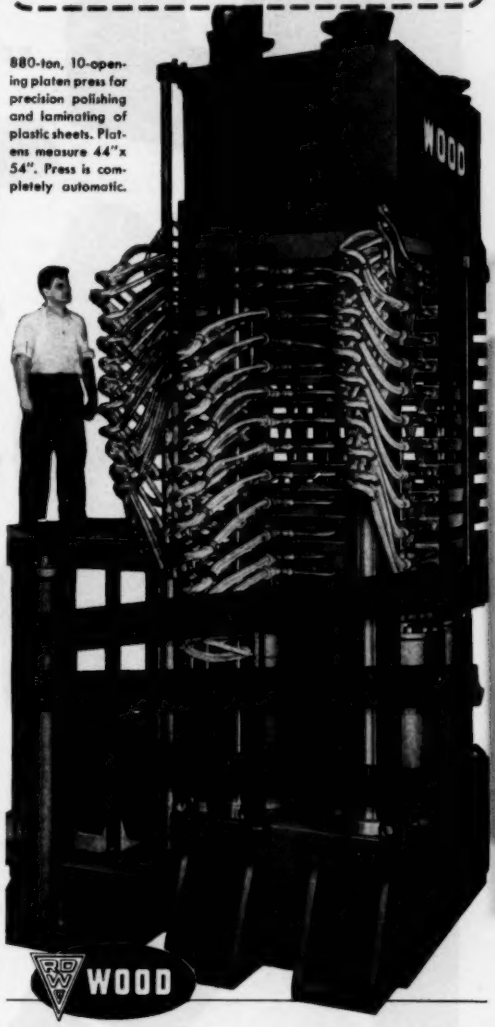
Write for samples and quotations.

The SILLCOCKS-MILLER Company

Pioneers in Plastic Fabrication since 1910

18 W. Parker Ave., Maplewood N. J.

If it's an **R. D. WOOD** *... It's Good**



880-ton, 10-opening platen press for precision polishing and laminating of plastic sheets. Platens measure 44"x 54". Press is completely automatic.

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING, PHILA. 5, PA.

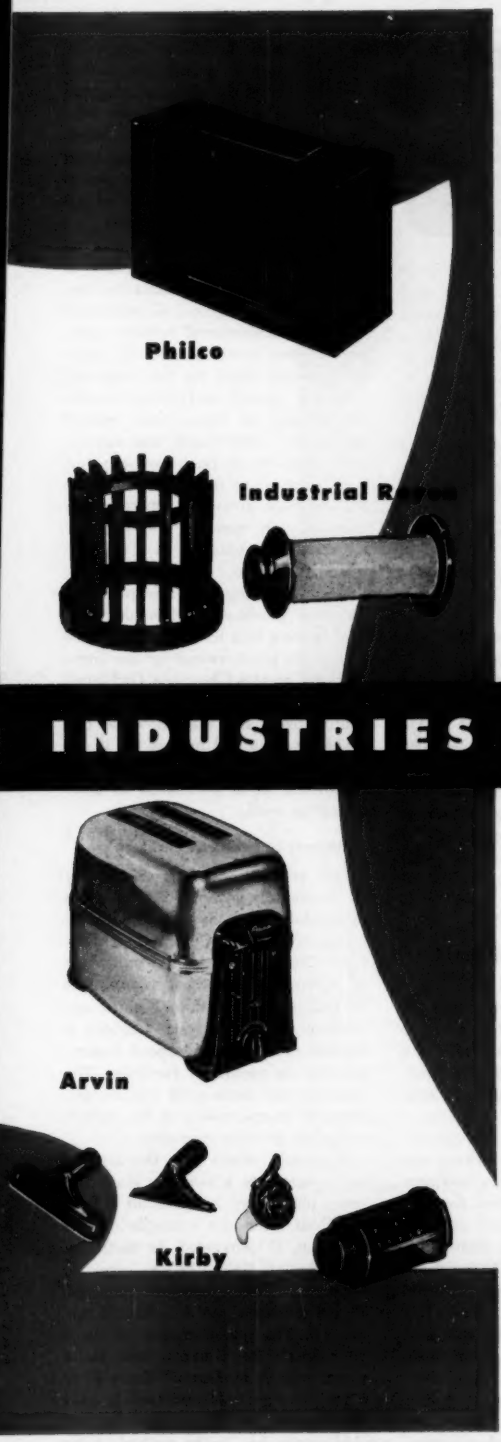
Established 1803

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE

ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

* FIND OUT WHY. SEND FOR YOUR FREE COPY OF OUR NEW PHOTOGRAPHIC BOOK OF PLANT FACILITIES.

RCA Victor
Universal
Kaiser
Lincoln
with mighty line company at
GENERAL
Carrier
Black & Decker
American Monorail



There are good reasons why these —and many other leading American manufacturers—rely on General Industries for quality molded plastics.

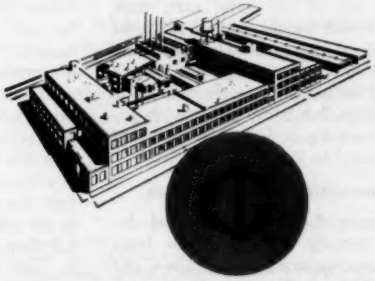
EXPERIENCE . . . for more than thirty-five years, General Industries has pioneered in the development and improvement of molded plastics, both thermosetting and thermoplastic.

PERSONNEL . . . General Industries' skilled engineers, mold-makers, press operators, finishers and inspectors—all veteran employees, form an integrated production team with an unsurpassed record of meeting customer delivery schedules *on time.*

EQUIPMENT . . . among the most modern and extensive to be found in America. *More than 140 compression and transfer presses,* ranging from 30- to 1800-tons pressure. *Latest-type high-frequency preheating ovens. 13 injection molding machines,* ranging from 2- to 22-oz. capacity. *Complete finishing, assembly and painting facilities, fully conveyorized for fast, efficient production.*

CENTRAL LOCATION . . . overnight delivery service to all points east of the Mississippi, assures dependable delivery of your molded plastic parts.

MORE INFORMATION about General Industries is contained in our 16-page booklet "Your Product in Plastic" . . . write for your *free* copy today.



The GENERAL INDUSTRIES Co.
Department S • Elyria, Ohio

THE PLASTISCOPE*

· NEWS AND INTERPRETATIONS OF THE NEWS

By R. L. Van Boskirk

How Much Formaldehyde?

IN THE rampant build-up of the chemical industry now going on in this nation, one of the most pesky problems confronting industrial planners is the matter of balance. Will there be enough plasticizer to meet the vinyl resin expansion; will there be enough formaldehyde to match the proposed phenol expansion; and so on and on and on? Even a few months' difference in arriving at a balance could mean a severe financial loss to the producer of a surplus.

Nevertheless, the chemical industry expansion program goes on at breakneck speed—indeed, it rivals in some respects even steel expansion, but with much less fanfare insofar as the public is concerned.

A great part of this chemical expansion program seems to be based on the idea that several types of plastics will increase in volume by two or three times their present production within the next three or four years, and can absorb all the raw materials capacity now being planned for a plastics future.

But here and there a questioning voice is being raised. Said one of the important officials of a chemical and plastics firm a few days ago: "We're going to have chemicals running out of our eyes, ears, nose, and mouth by the end of 1952—we will flood the earth with 'em. Sure—we are expanding like every other company in order to stay in the swim, but in my opinion, it's going to take a lot of good, stout swimmin' to keep up."

Thermosetting resin expansion

Among these chemicals that depend mainly on plastics for large volume consumption are phenol and formaldehyde. There must be enough of both to balance phenolic resin production and enough formaldehyde left over to team up with urea and melamine. Other uses for both are important, but plastics always have taken well over half of both and the expansion plans for both phenol and formaldehyde are based on a belief that plastics will continue to take an even larger percentage of the total poundage when the expansion program is fulfilled.

The formaldehyde expansion plans are among those in the doubtful class today because there are so many unknown factors involved.

Take the amount needed for use with phenol as an example. The estimated requirement for formaldehyde to use in all phenol-formaldehyde resins in 1951 is a little over 300 million pounds. For 1955 the estimated need for formaldehyde in phenolic resins might be around 500 million pounds. Urea and melamine resins will likely require 400 to 420 million lb. of formaldehyde in 1951—perhaps about 600 million in 1955. Pentaerythritol may require 200 million lb. in 1951; 300 million in 1955. All other uses including ethylene glycol might require 300 million lb. of formaldehyde in 1951. It is useless to guess what these "others" will require in 1955.

Demand may be overestimated

When all this is added up there is an estimated maximum demand for 1.3 billion lb. in 1951; for over 1.5 billion lb. in 1955 without allowing for an increase in the "miscellaneous" uses which may or may not materialize.

Right here is where the uncertainties multiply rapidly. There are now several analysts in the business who are willing to bet that demand is overestimated. They will concede that there may be some stringency in the near future, since it is doubtful that much more than 1 billion lb. will be produced in 1951; but even that amount may be sufficient if demand for the last quarter is no greater than the August and September rates. But the longer pull is something else again.

It is believed that under normal circumstances about 1.5 billion lb. of formaldehyde would be needed in 1955, but if the defense program progresses as planned and raw materials such as phenol, urea, phthalic anhydride (to be used with formaldehyde), and methanol are in sufficient supply, this figure of 1.5 billion would be reached in 1953.

Some of the analysts are convinced that the 1955 demand is based on somewhat fantastic requirements despite Government needs for undisclosed military purposes. They admit that hardly anyone guessed right on the projected need for phenol and formaldehyde when most of them were scared during the 1949 slump and expansion ideas were pooh-poohed; but they want more definite proof than has yet been given for future needs, especially in view of the peculiar situation now existing in formaldehyde production.

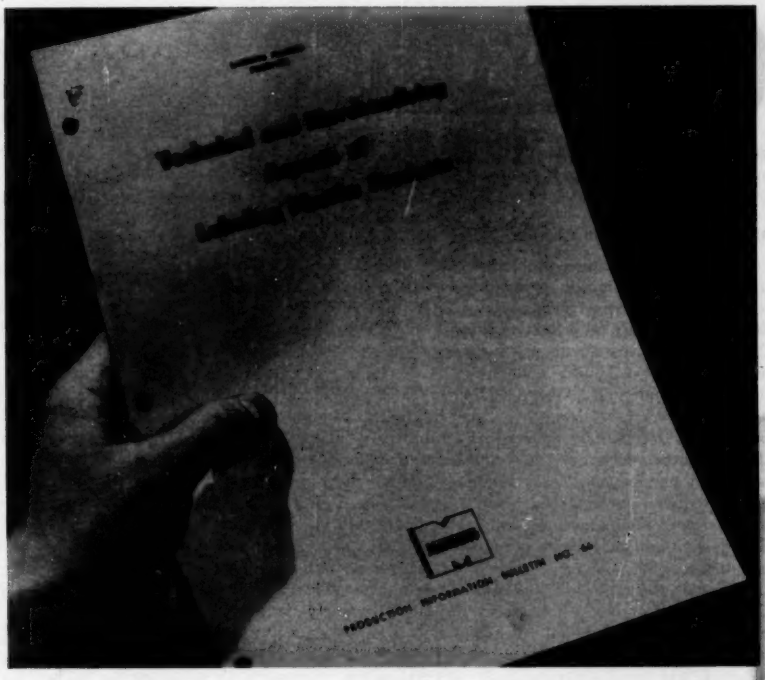
The first thing that any prospective new producer of formaldehyde sees staring him in the face is a 400 million lb. plant owned by the Government at the Cherokee Ordnance Plant. True, it has been somewhat cannibalized and may now be operable at only 320 million lb. if estimators are correct in their assumptions. It is scheduled to start operation soon.

Methanol is problem child

The second bogey is a scarcity of methanol without which most formaldehyde producers cannot operate. Currently Commercial Solvents Corp. is showing an indication of moving ahead—it is planning a 22 million gal. methanol plant according to the analysts. Carbide & Carbon is also talking about expansion of its methanol facilities. The Government owns a 10 million gal. plant at Morgantown, W.Va., which will soon go into operation.

Ammonia enters into the methanol program in a big way since the same plant may be used for either. Du Pont offers an example of this situation. It converted its methanol facilities at Belle, W.Va., over to ammonia when the new Orange, Texas, methanol plant came into operation. The question now is: Is it ever likely to convert that Belle plant back to methanol? Some 40 to 50 million gal. of methanol is said to be involved. The answer to that riddle may be: Is the nation's need

* Reg. U. S. Pat. Office.



Get this "How to do it" booklet on labeling

"How should I start a labeling program?" "What kind of label should I use?" Here are some answers to your questions on labeling.

Because of growing interest in informative labeling, sparked by the SPI program, Monsanto has prepared this new booklet, "Technical and Merchandising Aspects of Labeling Plastics Products." It describes types of labels, methods of attachment, and the mechanics of labeling, as well as some of the merchandising techniques of informative labeling.

To help you get started, Monsanto will design your label, suggest what to say and how to present your selling message in the most attractive attention-getting manner. You can have the assistance of our labeling experts without cost. It's Monsanto's way of helping you start the ball rolling on your own labeling program.

Take the first step now by writing for your copy of the booklet, "Technical and Merchandising Aspects of Labeling Plastics Products." Just fill in and mail the handy coupon—today.

MONSANTO
CHEMICALS—PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY,
Plastics Division, Room 2611, Springfield 2, Mass.

Please send me your booklet, "Technical and Merchandising Aspects of Labeling Plastics Products."

Name & Title _____

Company _____

Address _____

City, Zone, State _____

PLASTISCOPE

greater for ammonia than it is for methanol? Both are highly important to the defense program.

More formaldehyde in Canada

Added to this complex problem is a Canadian situation in formaldehyde that has various facets. Heyden Chemical Corp. and Shawinigan Chemicals, Ltd., are now equal partners in a plan to build a 30 million lb. formaldehyde plant in Canada. Carbide & Carbon is also building a formaldehyde plant in that country. Celanese has announced a new petro-chemical plant in Edmonton, Canada, which will produce both methanol and formaldehyde simultaneously from propane and butane gases—a similar operation to its Bishop, Texas, process. Celanese will thus be independent of a source for methanol—in fact, will have methanol as well as formaldehyde for sale.

It is not likely that any of this Canadian formaldehyde will be imported into the United States except under a war-time emergency. The tariff is prohibitive. But of course it will relieve the necessity for the export of some 20 million lb. or so to Canada from the United States. On the other hand, it is possible that the methanol raw material requirements for export to Canada for formaldehyde may increase the current short supply in the United States.

Further news on the domestic front for formaldehyde and methanol is that *New England Industries* is reported to have made a survey on the feasibility of building a plant to produce both the chemicals from natural gas somewhere in Texas: their findings are not as yet published. Another report is that General Aniline, Borden, and Phillips Petroleum have pooled resources to form the Alamo Chemical Co. in Texas for the production, of methanol, acetylene, and ammonia.

From the above it is not difficult to understand the complexities involved in trying to balance supply and demand—especially in these uncertain times of political upheaval. Furthermore, it is plain to see that the parent Chemical Industry has a watchful eye on its lusty offspring, the Plastics Industry, and is apparently confident that the offspring will grow rapidly. But how rapidly it will grow is a question that promotes ulcers and induces sleeplessness for analysts and managers who must make quick decisions and can't afford mistakes.

Rigid Vinyl Pipe

PLASTIC pipe gives promise of soon becoming one of the largest outlets for use of plastic materials. Among the newest types to be announced is Tuffstuff, a rigid polyvinyl chloride pipe produced by Clopay Corp., Cincinnati, Ohio.

Clopay points out that this pipe has been widely used in Europe since the early stages of World War II. It is particularly useful in chemical plants as a replacement for special alloys to carry both acids and alkalies. In one plant where stainless steel had been usable for only six to nine months, piping made of the new material has now been in use for more than 2½ years and is still holding up satisfactorily. The European petroleum industry has also made wide use of plastic piping.

Rigid polyvinyl chloride piping is extremely useful in irrigation, plumbing, and other underground applications, because it is resistant to acids and alkalies, relatively nontoxic, odorless, tasteless, and weighs less than 25% as much as steel.

Plastic Armor

RECENT wide-spread publicity concerning the Army's plastic armor for soldiers was surprising in that the subject had been generally held as restricted information. Army spokesmen say that they are still not willing to release any information concerning the production of these various types of armor, but want to point out that they are being used particularly to protect soldiers in the Medical Corps. In this connection it is interesting to note that 2800 decorations have been won by Corpsmen since the fracas in Korea began.

These various types of armor were briefly described in "Defense Machine Tools Up For Plastics," MODERN PLASTICS, *28*, 87 (June 1951). There has been little change in the material used since that time—in fact, there has been little change in the type of material for the last four years. The Doron type armor was tried out at the close of World War II. It consists of polyester glass laminated slabs inserted in canvas slots, and the whole fabricated to fit around the middle of a man's body. However, this particular type is rather clumsy and inflexible and is often superseded by a nylon fabric armor which may consist of as many as 32 layers of nylon impregnated with a plastic resin. This armor will not stop rifle bullets, but is used particularly against flak, shell fragments, and .45-caliber bullets.

The liners for helmets are compression molded with nylon fabric and a combination type resin which is as yet undisclosed. Several thousands of these liners are now on test. It is claimed that they have bullet resistance comparable to or better than metal.

The experimental eye piece, which is made with slits and protects the upper part of the face, is molded from a combination of translucent plastic materials.

Increased Production

ADDITIONAL production facilities and increased availability of raw materials have resulted in increased production of Plastolein 9250 (tetrahydrofurfuryl oleate), according to the producer, Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio.

Used mainly as a secondary plasticizer for vinyl compounding, Plastolein 9250 imparts low-temperature flexibility and excellent drape to vinyl film and sheeting. It is characterized by good oxidation stability, light color, and good heat and light stability.

Metallized Styrene

METALLIZATION of styrene through special processing techniques has been announced by Coating Products, 136 W. 21st St., New York, N.Y. Previously, metallic finishes were limited to applications on cellulose acetate. By adding styrene to its line, the manufacturer is able to offer a metallized material that has electrical applications at all

a GERING [illegible] *May* unshackle
your PROBLEM of

COST or DESIGN

TOOL HANDLES
LUGGAGE BINDING
ELECTRONIC INSULATION
APPLIANCE GASKETS
APPLIANCE BUMPERS
PACKAGING FILM
GARDEN HOSE
RODS
EDGING

Gering PRODUCTS . INC .

THE CARVER LABORATORY PRESS

the Standard Press of Many Uses...
...complete with Accessories for General Research
Some of the Many General Applications...continued
...for Quick—Accurate—Small Scale Tests

Send for Complete New Catalog

SOME OF ITS MANY USES IN
Plastics Laboratories

Testing single-cavity molds
Molding color samples.
Production of samples.
Plastics instruction and demonstration.
Metallographic mounting.
Metal insert mold tests.
Vulcanizing.
Drawing.
Forming.
Embossing.
Bonding plywood.
Testing tensile properties.
Testing compressive properties.
Testing shear strength.
Flow tests.
Crushing tests.
Breaking tests.
Determining heat cycles.

Send for your copy of this new handy-size manual containing up-to-date information on the Carver Laboratory Press and its many uses.

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
3 CHATHAM RD., SUMMIT, N. J.

Send catalog, describing Carver Laboratory Press and Standard Accessories.

NAME .....
FIRM .....
ADDRESS 61

PLASTISCOPE

frequencies, low moisture absorption, and light conductivity—all properties inherent in the styrene itself.

Suggested applications for the new material include display packaging, electrical uses, toys, light conductors for three-dimensional advertising, and place mats. It is available in gages of 0.003, 0.005, 0.0065, 0.0075, and 0.010 in. in 20 in. width, and in rolls of 500 to 1000 ft. on 3-in. i.d. cores. Rolls can be slit or sheeted to meet specific requirements.

New Formaldehyde Producer

JOINT formation of a new Canadian company to manufacture formaldehyde and pentaerythritol has been announced by Heyden Chemical Corp. and Shawinigan Chemicals, Ltd. The two companies will share equally in stock ownership of the new firm, which will construct a $2 million plant at a site to be selected in Canada. Annual production capacity of the plant is expected to be 30 million lb. of formaldehyde and 3 million lb. of pentaerythritol, a solid alcohol made from formaldehyde which is the base for quick-drying paints, varnishes, resins, and lacquers now specified for Armed Service use.

Candidates for Citation

IN THE eleventh annual survey of stockholder reports conducted by *Financial World*, ten plastics companies have qualified for "Highest Merit" citations. The companies, selected from among 5000 corporations submitting reports for 1950, are American Phenolic Corp.; American Insulator Corp.; Continental-Diamond Fibre Co.; The Dobecknum Co.; Dracket Co.; Durez Plastics & Chemicals, Inc.; Minnesota Mining & Mfg. Co.; National Vulcanized Fibre Co.; The Richardson Co.; and Rogers Corp.

The stockholder reports of the firms named above have become candidates for final judging. One will be selected for a "Best of Industry" award and presented with a bronze "Oscar of Industry" at the *Financial World* Annual Report Awards Banquet on Oct. 29, 1951, at the Hotel Statler, New York. The 1949 annual report of Minnesota Mining & Mfg. Co. won the trophy in this industrial classification last year.

T.V. Color Concentrates

QUICK-drying color concentrates for use on three-color cellulose acetate television filters and three-color rotating disks have been developed by Schwartz Chemical Co., New York, N.Y. The colors are said to be light-fast. They can be quickly applied to cellulose acetate sheeting by an air-spray brush. Simple masks can be used to air-spray one color at a time while protecting the rest of the color wheel. The concentrate, formulated at the request of the television industry, is available in T.V. blue, amber, and green for three-color filters. For use on three-color disks, the colors are being produced in T.V. red, blue, and green.

Polyester Molding Compounds

ADDED strength and chemical resistance over conventional molding compounds is offered by Dryply PreImp, a polyester pre-impregnated glass fiber compound developed by Flexfirm Products, El Monte, Calif. The manufacturer claims it is the first compound of its kind to offer molders a polyester resin with uniformly distributed fiber content usable in present molding techniques. Dryply PreImp combines the chemical resistance of polyester resin with the high impact, physical strength, and heat resistance of glass fibers. As packaged, the product is ready for use with standard compression and transfer molding techniques and equipment. It has a shelf life of six months or longer at normal room temperature.

Vinyl for Bicycle Saddles

EXTENSIVE research carried on by Textileather Corp., Toledo, Ohio, on behalf of Lobdell-Emery Mfg. Co., manufacturer of bicycle saddles, has resulted in the development of a vinyl material for saddle tops. The vinyl formulation solves the problems posed by the Lobdell-Emery processing method; it can take a deep draw, hot forming operation because of its special characteristics of gauge and pliability.

Textileather's vinyl replaces the expensive leather used previously. Gordon L. Armstrong, general sales manager of Lobdell-Emery, states: "We believe that at least 90% of all the better grade saddles manufactured by the industry now use vinyl saddle material, a complete change brought about by the superiority of this material over any other developed to date."

Vinyl Decal

COLLABORATION between Palm, Fechteler Co., Inc., New York, N.Y. and Goodyear Tire & Rubber Co. has produced a new type of vinyl decal. The vinyl decal is welded to vinyl sheeting; if the fabric stretches, the decal is elastic enough to be extended without cracking or flaking. It is now used on bullet sealing fuel cells manufactured by Goodyear.

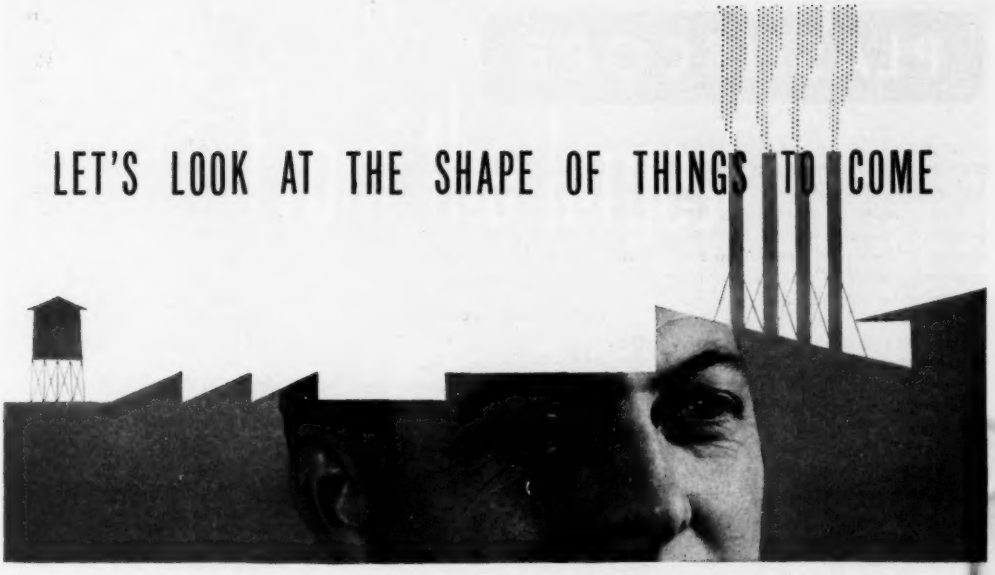
Laboratory Dedication

THE Freund Instrumentation Laboratory at Illinois Institute of Technology, named in honor of the late Erwin O. Freund, founder of Visking Corp., was dedicated Sept. 28, and a plaque was placed in the laboratory. Visking has contributed generously to the support of Illinois Tech for a number of years. The Freund Foundation also provides an annual fellowship and a scholarship at Illinois Tech.

Vinyl Foam

VINYL foam or sponge vinyl can be produced from a new type plastisol just announced by Finishes Div., Interchemical Corp., 67 W. 44th St., New York 18, N.Y. Foam from this plastisol may be produced without pressure—only heat is required. The time-temperature cycle is determined by the density and thickness required. For example, an expanded foam ⅛ in. thick with a density of 12 lb. per cu. ft. may be produced in 10 min. at 350° F. An expanded foam ½ in. thick with a density of 6 lb. per cu. ft. will require 25 min. at 350° F. The company claims that production time for formulating this type vinyl foam is two to three times faster than any

LET'S LOOK AT THE SHAPE OF THINGS TO COME



YOUR CUSTOMERS CAN CUT COSTS...

MAKE LARGER PARTS FASTER

WITH PLASTICS

When your customers' consideration of future materials gets right down to the brass-tacks planning stage, the subject of plastics always emerges. Well it might, for plastics today are no longer temporary expedients but basic raw materials which out-perform many others in numerous applications.

The time-saving, cost-cutting features of plastics, especially polystyrene, have been proved to industries making large-area moldings in one piece. Yet the design freedom, moldability and flexibility of polystyrene are such that its applicability is not limited. Small buttons, as well as 600-square-inch parts for appliances, can be made efficiently, economically and speedily.

Styron (Dow polystyrene) is a trademark name for a group of plastics whose special properties are helping industries turn out improved products and cut costs. As your customers take a long look at the shape of things to come, they may feel that plastics have earned a fuller place in their future plans. Dow's Plastics Technical Service is fully equipped to help you and your customers determine whether plastics are the basic raw materials that will improve products, boost production and cut costs. WRITE DOW TODAY.

THE DOW CHEMICAL COMPANY

Plastics Department—PL-116

MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Atlanta
Cleveland • Detroit • Chicago • St. Louis • Houston
Los Angeles • San Francisco • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

STYRON

BRAND PLASTICS

. . . basic raw materials serving basic industries . . .

DOW plastics

PLASTISCOPE

other method so far announced and that, in addition, most other methods require pressure.

This special plastisol may be poured in a mold, knife-coated, or cast on a fabric, and then baked the required amount of time. The plastisol may be colored. In view of its flame-proofness and resistance to oil, grease, and chemicals, it presents certain advantages not available in other types of foam. It is even possible that this material may be economically comparable with foam rubber in the near future.

The company admits that at the present moment not many applications have been found for this particular material, but it is hopeful that when its properties and workability are more widely known to the trade, processors will begin to find many uses for the product. The company also announces that it is now formulating conventional type plastisols for slush molding, dipping, coating, and so forth.

Extruder Expansion

ANOTHER expansion in its plastics machinery equipment program has been announced by F. J. Stokes Machine Co., Philadelphia, Pa. Arrangements have been made with R. H. Windsor & Co., Ltd., England, for Stokes to handle that company's plastics and compounding equipment in the United States.

Service and parts for the new Stokes-Windsor extruders will be handled at Stokes' recently enlarged plant. Die design, complete advisory service, and laboratory testing facilities will be at the disposal of manufacturers who purchase the equipment.

New Vinyl and Ethyl Chloride Plant

TWO companies, Shell Chemical Corp., and Diamond Alkali Co., are pooling their resources to manufacture and market vinyl chloride monomer in Houston, Texas. Shell will supply the ethylene from petroleum; Diamond Alkali the chlorine from salt. Shell has also announced that it will expand its ethyl chloride production capacity because of an expanding need for this chemical in the manufacture of tetraethyl lead and for ethyl cellulose. Raw materials for the synthesis of ethyl chloride are ethylene and hydrochloric acid, the latter of which will be available as a co-product in the vinyl chloride plant.

Coated Fabric Specifications

SEVERAL meetings with government procurement agencies to try to clarify certain specifications for plastics-coated materials have been announced by C. A. Alt, chairman of the Plastic Coatings and Film Association which recently met at Toledo, Ohio. Such industry-government cooperation, Mr. Alt said, could do much to speed development of plastics-coated materials for defense agencies.

Cornell Opens New Laboratory

ESTABLISHMENT of a laboratory devoted to rubber and plastics has been announced by Cornell University. Set up as part of the School of Chemical and Metallurgical Engineering, the new unit has been named the William C. Geer Laboratory of Rubber and Plastics in honor of Dr. Geer, a well known rubber chemist who donated private equipment, funds for additional apparatus, and a valuable rubber library. The equipment forms a complete unit for producing, vulcanizing, and testing rubbers.

Fine Mesh Screen

A NEW type screen for use in pulverizing plastics materials has been announced by Pyramid Screen Co., 30 Church St., New York 7, N.Y. Company spokesmen assert that it is different from conventional woven wire screen and will not clog. It can be made of steel, brass, bronze, or copper, and has a conical hole perforated plate with openings as fine as 0.01 in. and plate thickness two to three times that of the hole diameters. Extra plate thicknesses give many times the life of other screen types with much finer openings than have hitherto been obtainable in perforated plates.

The company also offers perforated plates in which the openings are etched by an electrolytic process. They are made in pure nickel and in nickel chromium with openings as fine as 325 mesh. Openings may be round, square, or slotted.

Both these types of plates offer much longer life, finer openings for improved products, and decreased blinding with the conical shaped holes. Pyramid says that additional data and specifications may be obtained from the home office. The new screen is imported from Europe, but Pyramid has obtained the rights for manufacturing and selling in the United States.

COMPANY NOTES

Sierra Electric & Mfg. Co. has purchased McDonald Mfg. Co., plastics and electrical manufacturer. Sierra is planning to increase its custom molding facilities and its line of wiring devices.

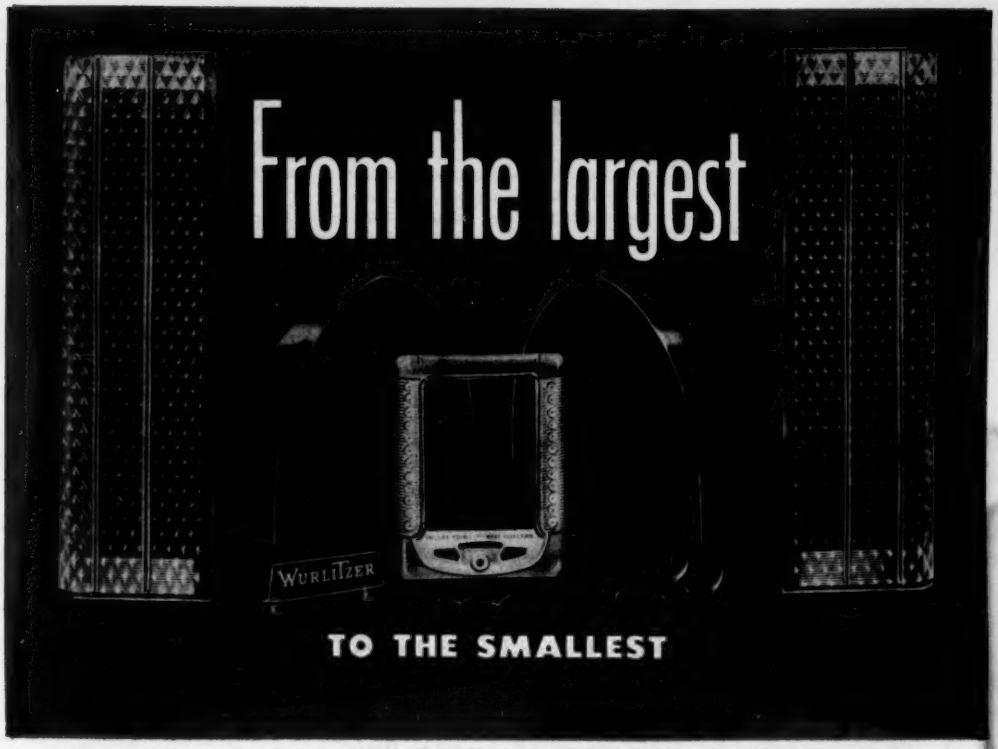
Jessall Plastics, Inc., has moved its factory to Kensington, Conn., where the company has bought a new 10,000 sq. ft. plant and enlarged its extrusion capacity.

Southern Alkali Corp., a wholly-owned subsidiary of Pittsburgh Plate Glass Co., has announced that the corporate name has been changed to **Columbia-Southern Chemical Corp.** There is no change in personnel or policy.

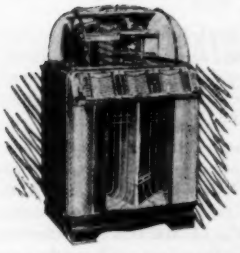
Nas-Kay Industries, 55th St. and Wyalusing Ave., Philadelphia 31, Pa., has been granted official approval by the U.S. Navy to manufacture edge lit panels according to Specification AN-P-89.

The J. H. Savage Associates, manufacturers' representatives, has established central offices at 105 Bedford St., Stamford, Conn. The firm will continue to maintain its office at 20 Vesey St., New York City.

United States Rubber Co. has announced the appointment of **H. Gordon Smith** to the newly created post of executive vice president. **Naugatuck Chemical Div.** has announced that **Frank B. Molen**, Midwest technical sales representative for Kralastic molding powders and Vibrin polyester resins, has moved his headquarters to 247 E. Exchange St., Akron, Ohio. **Richard H. Malamphy**, Eastern seaboard representative for the above products, has established new headquarters in the division's



An efficient, economical single source for Custom Injection Molded Plastics . . . ERIE RESISTOR



Ten different parts, ranging from small selector buttons to the 27-inch curved pilasters are economically custom molded by ERIE for this Wurlitzer Model 1400 phonograph.

A great battery of 23 presses, in capacities from 2 to 60 ounces, make ERIE RESISTOR one of the largest in the custom injection molding industry, with a versatility that provides economical production of pieces from minutely small items to the largest produced.

Two-ounce presses give economical production on the smallest pieces, while 60-ounce presses have a capacity for the largest pieces made. At ERIE RESISTOR the wide range of capacities between presses make it possible to plan, with single or multiple cavity dies, for efficient production of any order, large or small, for pieces large or small. All dies are designed in our own plant, by engineers whose experience extends through the life of the industry.

Regardless of your plastic needs—a functional product part, a sales-slanted durable package, or a lasting identification symbol—you will find the answer at the Plastics Division of Erie Resistor, the pioneer custom injection molder.

ERIE RESISTOR CORP., ERIE, PA.
LONDON, ENGLAND . . . TORONTO CANADA

PLASTISCOPE

branch office at 254 Fourth Ave., New York, N. Y.

Hercules Powder Co. has announced that **Branford P. Hoffman** has been appointed to the newly-created position of purchasing supervisor at the Hercules Experiment Station, the firm's central research laboratories near Wilmington, Del. **Robert A. Collins** has been transferred to the firm's plant at Hattiesburg, Miss., as assistant plant superintendent. **John M. Egan** succeeds him as assistant superintendent of the Brunswick, Ga., plant.

General Electric Co.'s Chemical Div. has announced the appointment of **T. G. Thompson** as supervisor of costs for the phenolic products plant at Pittsfield, Mass., and of **Arthur T. Bourgault** as manufacturing analyst for the **Chemical Materials Department. C. W. Bryant** has been named manager of the purchasing section of the concern's Materials & Purchasing Department. **Robert L. Hatch** and **Stanley Seltzer** have joined the process development laboratory of the **Chemical Division.**

The Keflex Corp. has changed its firm name to **Vitro Corp. of America.** The address, 233 Broadway, New York, N.Y., remains the same.

The Reliance Electric & Engineering Co. has promoted **Paul W. Arnold** and **Richard A. Geuder** to the general sales organization.

Libbey-Owens-Ford Glass Co. has named **Don W. Lyon** as manager of textile sales in the new **Fiber Glass Division. William F. Schneider** has been appointed general foreman of the **Superfine Dept.** of the new division which will manufacture three groups of very small diameter fibers for insulation in aircraft, automobiles, and for flotation products.

Monsanto Chemical Co. has announced that **James R. Turnbull,** general sales manager, **Plastics Div.,** has been given a temporary leave of absence to work on special polymer marketing problems for the company's **Executive Committee.** During his absence **Charles Lichtenberg,** assistant general sales manager, will be responsible for the division's sales activities. Two new assistant general sales managers have been appointed. They are **Edwin L. Hobson,** thermoplastic molding materials sales manager, and **R. C. Evans,** sales manager of Vuepak and sheets. **David Guarnaccia** will succeed Mr. Hobson, and **Edwin V. Hellyar** has been named assistant sales manager of sheet materials.

The Standard Machinery Co., Mystic, Conn., announces the appointment of **Ralph B. Symons** and **William A. Shilling** as sales engineers for the company's line of extruding machines and accessories for the rubber, plastics, and electrical wire and cable industries. **Henry Eickhoff** and **Walter F. Fanning** have joined the engineering design department.

Gladwin Plastics, Inc., has moved to larger quarters at 275 Houston St., N.E., Atlanta, Ga.

The General Tire & Rubber Co. has established a market research department to be headed by **Henry H. McKee, Jr.**

American Cyanamid Co. has consolidated several office and warehouse locations in Los Angeles, Calif., into one newly-constructed building at 2300 S. Eastern Ave. This move is the fourth of its kind undertaken by the company as part of a nationwide program calling for similar consolidations in other major cities of the United States and Canada.

Como Plastics, Inc., is the new name of the organization formerly known as **Columbus Molded Plastics Corp.,** Columbus, Ind. The company has made a change in name only to obtain a shorter name, and because the former name was too much like several other companies now in existence; trademark, policies, and personnel will remain the same.

U.S. Rubber Co. announces that it has acquired the assets of the Chicago Die Mold Mfg. Co., Wrightwood Ave. and No. Pulaski Blvd., Chicago. The business will be operated as **Chicago Die Mold, Div. of U.S. Rubber Co.** The former owner, **E. A. Peterson,** will remain as manager, and there will be no change in personnel. The company currently employs about 220 people. U.S. Rubber will expand production facilities to manufacture industrial products from its new plastic compounds, Uscolite, a styrene copolymer sheet material, and Enrup, a phenolic-rubber molding material.

Gering Products, Inc., Kenilworth, N.J., has announced a price reduction for their 17 PMMA standard colors and several special colors in polystyrene Drycol coloring agents effective last Oct. 1. All prices include Blend-eze, the wetting agent that prevents pigment dusting and aids color dispersion. Price reduction was made possible by increasingly larger sales volume.

PERSONAL

Howard M. Mitchell has been appointed personnel manager of **Monsanto Chemical Co.'s Plastics Div.**

Richard Hall, formerly with General Electric Co., has been named sales representative in Cleveland, Ohio, for **Plax Corp.,** Hartford, Conn.

Dr. James F. Eversole has been appointed manager of research administration of **Union Carbide and Carbon Corp.,** where he will help coordinate the company's research activities on alloys, chemicals, carbons, and plastics.

Harry R. La Towsky, Jr., has joined the New England staff of **F. J. Stokes Machine Co.** His headquarters are at 71 Charles St., Boston, Mass.

Tom Drabek has been named **Midwest Div.** sales manager for Boltaron, moldable plastic sheet stock manufactured by **Bolta Products Sales, Inc.**

W. Cordes Snyder has been elected president and chief executive officer of **Blaw-Knox Co.,** and is expected to assume his new duties about Nov. 1. **William P. Witherow,** formerly president, will continue as chairman of the board. Mr. Snyder was formerly vice president of Koppers Co., Inc.

L. Dow Moore, formerly associated with Koppers Co., Inc., has been named technical director of **Ferro Corp.'s** newly-formed **Fiber Glass Div.** at Nashville, Tenn., where a new plant is under construction.

R. W. Lindsey, formerly with

WHERE UNIFORMITY IS VITAL...

HEYDEN FORMALDEHYDE ASSURES IT!

Production of high quality, properly bonded plywoods requires, above all, reliable resin adhesives. The specific use of the plywood determines whether a resorcinol-, phenol-, melamine- or urea-formaldehyde resin is most suitable. All of these resins require exacting formulation with chemicals of dependable uniformity and purity.

Heyden Formaldehyde—manufactured under rigid laboratory control from raw materials constantly checked for high purity—assures uniformly fine quality in the finished product, whether it be plywood, adhesives, plastics, paper, textiles, dyes or a hundred and one other critical materials. It is a clear, colorless solution assaying not less than 37% by weight—produced as Formaldehyde Solution N.F. or as Methanol-free Formaldehyde. It is shipped in container sizes to suit your needs —tank cars, tank trucks, drums, carboys and bottles.

⬢ PARAFORMALDEHYDE

(U.S.P. X)—an equally reliable source of methylene linkages, equivalent to Heyden Formaldehyde in purity and uniformity. Powder, Flo Granules and Granules.

⬢ HEXAMETHYLENETETRAMINE

—technical or U.S.P., granular and powder. Highest quality, for use in resins, plastics, chemicals or pharmaceuticals.

Samples and technical information sent promptly on request.

FINE HEYDEN CHEMICALS

Serving Industry Through Finer Chemicals

Benzaldehyde • Benzoates • Benzyl Chloride • Bromides • Chlorinated Aromatics • Creosotes • Formaldehyde • Formic Acid • Glycerophosphates • Guaiacols • Hexamethylenetetramine • Medicinal Colloids • Methylene Disalicylic Acid • Paraformaldehyde • Parahydroxybenzoates • Penicillin • Pentaerythritols • Propyl Gallate • Resorcinol • Salicylates • Salicylic Acid • Streptomycin

PLASTISCOPE

Catalin Corp., is now vice president in charge of sales for **Tumble-Buff Finishing Laboratories, Inc.**, 118-01 101st Ave., Richmond Hill, N. Y. The company manufactures and supplies compounds for finishing plastic products and specializes in fabricating and finishing plastic parts.

Milan F. Dudeff has been elected vice president in charge of sales and engineering for **Charles Beck Machine Corp.**, Philadelphia, Pa.

William H. Curtiss, Jr., has been appointed to the newly created position of Fiberglas textile sales manager on the West Coast for **Owens-Corning Fiberglas Corp.** His headquarters are in Santa Clara, Calif.

Dr. Mark E. Putnam has been elected to the newly created position of executive vice president of **The Dow Chemical Co.** Dr. Putnam has been with the firm since 1915.

John A. Croft has been elected corporation secretary for **Extruder's, Inc.**, Culver City, Calif., where he will be in charge of cost accounting.

John Reese has been named product manager for vinyl embossed leathers, upholstery, handbags, seat covers, dinette sets, and luggage for **The General Tire & Rubber Co.'s** plastic manufacturing operation at Jeannette, Pa.

Dr. C. F. Fryling has joined the **Research Dept.** of **Kopper's Co., Inc.**, and will supervise special research projects. Since 1945 he has been supervisor of polymerization research for Philips Petroleum Co. where a large portion of his work consisted in the development of the cold rubber process.

C. K. Goebel has been appointed manager of the **Plastics Div., William Whitman Co.**, 261 Fifth Ave., New York 16, N. Y. In that position he will be in charge of all sales and development work of plastic film and extruded plastics manufactured by the firm. He has been associated with the company for 29 years.

Stanley B. Elliott has been named vice president and general manager of **Ferro Chemical Corp.** He is in charge of all operations at the firm's two Bedford, Ohio, plants which produce metallic soaps, driers, stabilizers, and special chemical material used by the government.

Robert E. Rulison has been named district sales manager in the Chicago area for **Baker Castor Oil Co.** His office is at 105 W. Adams St.

Edward J. Maroney has been appointed a vice president of U. S. Plywood Corp. He has been with the firm 17 years.

Dr. Daniel S. Trifan has joined the Plastics Laboratory of Princeton University as head of the chemical section.

Robert Wright has been named purchasing agent for **The Watson-Stillman Co. William Donner** has been promoted to assistant buyer.

Harold C. Weingartner has been elected vice president and general manager of **Equipment Div., National Research Corp.**, Cambridge, Mass.

H. J. West has been named technical director of **American Cyanamid Co.'s** plant in Bridgeville, Pa.

Bjarne Klaussen has been elected executive vice president of **Hooker Electrochemical Co.** He joined the organization in 1916 as a research chemist. **Donald E. Springer** has been appointed chief engineer of the firm.

George R. Vila, general sales manager of **Naugatuck Chemical Div., United States Rubber Co.**, has received a certificate of appreciation from the U. S. Army for his work as a member of the group of scientists who investigated the research phases of the German synthetic rubber industry in 1945. Their findings led to the development of cold GR-S synthetic rubber in the U. S.

Deceased

Hubert D. Bennett, 56, a pioneer in the plastics industry, died recently in Toledo, Ohio. Mr. Bennett founded **Plaskon, Inc.**, now a division of **Libbey-Owens-Ford Glass Co.** He was also president of Defiance Machine Works which recently introduced a new type of preform press to the plastics industry. Mr. Bennett was born in Washington, D. C., and his father was one of the first general managers of Willys Co. He attended Shattuck School in Fairbault, Minn., and then enrolled in Williams College from which he was graduated in 1917. He was a leader in the movement which established a new form of government in Toledo in 1935 and helped to originate the Toledo Association, the group that publicized Toledo's merits during the early 1930's. Anthony Wayne Industrial Research Bureau, which later became a part of the University of Toledo, was founded largely through the efforts of Mr. Bennett.

MEETINGS

Nov. 7-9—American Society of Body Engineers, Annual Technical Convention, Rackham Memorial Bldg., Detroit, Mich.

Nov. 8-9—National Conference on Industrial Hydraulics, 7th Annual Meeting, Sherman Hotel, Chicago, Ill.

Nov. 26-Dec. 1—Chemical Industries, 23rd Exposition, Grand Central Palace, New York, N. Y.

Dec. 2-5—American Institute of Chemical Engineers, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N.J.

Dec. 13-14—Society of the Plastics Industry, Third Film, Sheeting & Coated Fabrics Div. Conference, Hotel Commodore, New York, N.Y.

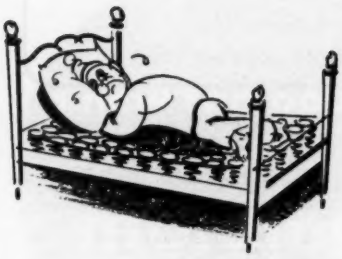
Jan. 14-17—Plant Maintenance Show, Convention Hall, Philadelphia, Pa.

Feb. 21-22—Society of the Plastics Industry, (Canada) Ltd., 10th Annual Conference, Royal York Hotel, Toronto.

S.P.E. Meetings

Nov. 14—New York Section of S. P. E. Gotham Hotel, New York, N. Y. H. A. Meyrick, president, Industrial Mfg. Co., will deliver a talk on "Mold Temperature Control for Injection Molding."

Jan. 16-18—8th Annual National Technical Conference, Edgewater Beach Hotel, Chicago, Ill.



in

Precision Plastic Molding
VICTORY would do the job
COMPLETE!

Put Victory's *complete* facilities to work for you . . .

- **ENGINEERING**—Victory's staff of engineers includes specialists in the mechanical, electrical and chemical fields.
- **MOLD MAKING**—Victory's complete and modern tool room is supervised by men with over 30 years' "Know-How" specializing in injection molds.
- **INJECTION MOLDING**—Victory's ultra-modern, high-speed equipment, newly expanded production facilities, and competent use of controlled molding techniques assure top quality.
- **ASSEMBLY**—Victory's conveyor line operation guarantees top speed and economy on plastics as well as the most complex electro-mechanical assemblies.
- **FINISHING**—Victory's up-to-date automatic paint spraying, hot stamping and silk screening equipment gives you custom-finish jobs at production line prices.
- **ATTENTION: SALES ORGANIZATIONS**—Victory will manufacture and package your product, individually and in multiple-unit cases, preparing it for immediate shipment to your customers.

"All operations under one roof" saves you time, effort and money. Let us help you with your thinking. Contact us NOW!

Examples of Victory's Precision Plastic Molding

VICTORY MANUFACTURING COMPANY
1726 West Arcade Place • Chicago 12, Illinois
ESTABLISHED IN 1930
Up to 200-ounce Shots

CELLULOSE ACETATE BUTYRATE • POLYSTYRENE • NYLON • METHYL METHACRYLATE • POLYVINYL BUTYRAL • CELLULOSE ACETATE • ETHYL CELLULOSE • POLYETHYLENE • POLYVINYL CHLORIDE

PLASTIC SCRAP

WE BUY IT
SELL IT
PROCESS IT

Plastics Division:

H. MUEHLSTEIN & CO. INC.

60 EAST 42nd STREET, NEW YORK 17, N. Y.

BRANCH OFFICES: Akron • Chicago • Boston • Los Angeles • Memphis
WAREHOUSES: Jersey City • Akron • Boston • Los Angeles • Memphis

CLASSIFIED ADVERTISEMENTS

MODERN PLASTICS reserves the right to accept, reject or censor classified copy.

EMPLOYMENT • BUSINESS OPPORTUNITIES • EQUIPMENT (used or resale only)

MACHINERY and EQUIPMENT FOR SALE

FOR SALE: Quick delivery Rubber and Plastic Equipment. Farrel 18" x 45", 16" x 48", and 15" x 36", 2 roll rubber mills. New 6" x 12" Lab. Mixing Mills and Calenders. Vaughn 60" Mill and 125 HP motor. Royle #½ & #2 extruders, also other sizes. 180 ton F.B. Molding Press, 20" x 20". Francis 175 tons 24" x 18". W.S. 115 ton 24" x 24". Also presses Lab. to 1500 tons from 12" x 12" to 48" x 48". Hydr. Oil Pumps Watson Stillman Hor. 4 plgr. 1½" & 2½ x 4" H&L. Pressure pump. HPM 10 GPM 2700 lbs. Elmes Hor. 4 Plgr. 5&8 GPM 4500 lbs. & 5500 lbs. Hyfr. Accumulators. Stokes Automatic Molding Presses. Rotary & Single punch Tablet Machines ½" to 3". Reed-Prentice 8 oz. Injection Molding Machine late 1947, also other sizes. Baker Perkins jacketed mixers 200 & 9 gal. Impregnating units. Ball & Jewell #0 & Loominster #0 Plastic Grinders. Mikro Pulverizers 2 DH. 10 HP & other sizes. Heavy duty mixers, grinders, pulverizers, gas boilers etc. Partial listing. We buy your surplus machinery. Stein Equipment Co. 90 West Street, New York 6, N.Y. Worth 2-5745.

FOR SALE: Thermex Preheater. Model 2P; Airtronics Preheater. Model D E; Airtronics Preheater. Model C R. Like new. AARON MACHINERY CO., INC. WOrth 4-8233, 45 Crosby St., New York 12, N. Y.

SAVE WITH GUARANTEED REBUILT EQUIPMENT — HYDRAULIC PRESSES. 24" x 24", 18" ram 210 tons; 24" x 56", 450 ton multiple opening; 24" x 24", 16" ram, 250 tons; 24" x 24", 12" ram, 170 tons; 24" x 42", 2—12" rams, 340 tons, 42" x 42", 16" ram, 250 tons; 36" x 36", 12" ram, 141 tons; 20" x 18", 10" ram 118 tons; 20" x 20", 10" ram, 118 tons; 19" x 24", 14" ram, 78 tons; 23" x 15", 8" ram, 75 tons; 27" x 21", 8" ram, 75 tons; 15" x 15", 8" ram, 75 tons; 12" x 12" 7½" ram, 60 tons; 12" x 12", 6½" ram, 50 tons; 8" x 9½", 4½" ram, 20 tons; 16" x 16", 3½" ram, 12 tons; Laboratory Presses: 10 ton Carver 6" x 6". Watson Stillman 30 ton, 6" x 6"; Laboratory Mills and Calenders (NEW) M. D.; THROPP Mill 10" x 40" M. D.; NEW DUAL PUMPING UNITS, all sizes; Extruders: Royle Rubber #2, Royle Plastic #1, PREFORM PRESSES, Stokes T. Colton, 5½ T and Stokes DD84 with Reeves Drives, also Mixers, Vulcanizers, Accumulators, etc. Universal Hydraulic Machinery Company. 285 Hudson Street, New York City 13, N. Y.

FOR SALE: 50 Ton Stokes Presses & Pump. 200 Ton W.S. Hobbing PRESS, 300 Ton W.S. PRESS 24 x 20 Platen, 175 Ton H.P.M. PRESS 30 x 30 Platen, 150 Ton Farrel PRESS 30 x 30 Elec. Plates. 140 Ton W.S. PRESS 23 x 17 Platens, 85 Ton Stewart Bolling PRESS 20 x 20 Platen, 60 Ton Elmes PRESS with 18 x 18 Elec. Plates. 75 Ton W.S. PRESS 15 x 15 Platen, 75 Ton Adamson PRESS 20 x 20 Platens. Laboratory presses. Accumulators, Piston and Oil Pumps. AARON MACHINERY CO., INC. 45 Crosby St., N.Y.C.

FOR SALE: 1 Stokes DD2 Rotary Tablet Machine, Vari-Speed Drive and motor; 1—Farrel 16" x 42" Rubber Mill complete with drive and 75 H.P. Motor; 2—Ball & Jewel #2 Rotary Cutters, 50 H.P. Motors. Also Grinders, Extruders, Compression and Injection Molding Presses, Mixers, etc. Send us your inquiries. Consolidated Products Co., 13-14 Park Row, New York 38, New York.

FOR SALE: Injection Presses: 4, 7, 16 oz HPM, 8 oz Watson, 22 oz Lester, 22 oz Impco, 2 oz DeMattia. 1 oz Vandern. Extruders: BenchLab, 1½" NRM. 1—Sheet Die 51" for NRM extruder & takeup unit. 1—Johnstone 42" Slitting & Rewinding mach. 1—Lab Banbury-mixer. Scrapgrinders. 4—Miskella Infrared Dryers. Compression Presses: 50, 75, 250 tons. 2—Electronic Preheaters. Preformpresses: 1—Stokes R, 1—KuxNo 60, 1—KuxNo 65B. 1—Nash Rotary Edger. 2—Embossing Calenders 61" wide. 1—Sheridan Embossing Press; 1—Paterson Stainl. steel 500 lbs Conical Mixer. Justin Zenner, 823 W Waveland Ave., Chicago 13, Ill.

FOR SALE: One model 325 special Detrex Degreaser No. 31754. Also 12 American Marsh Hydraulic Pumps. This is excellent equipment and will be disposed of at a small fraction of its original cost. Write to CAPAC PLASTICS, INC., Capac, Michigan.

We handle hydraulic presses, pumps, and power units of all sizes. Write us your requirements and we will try to help you. We find it impossible to list our equipment in this classified column due to the fact that the equipment is sold before ad is published. For those who seek action look in the New York Times under the Machinery and Tool Column for our regular Sunday Special. Hydraulic Sal-Press, Inc., 386-90 Warren Street, Brooklyn 2, N.Y. MAin 4-7847

FOR SALE—3 slightly used HPM 250-H-9 complete electric heating chambers with heating bands. HPM Part No. BM11885. Injection Molding Company, 3823 Independence Avenue Kansas City, Missouri. Phone CHestnut 4250.

PRESSES—IMMEDIATE DELIVERY: 1800 Ton R.D. Wood Hydr. #H-226 22" opng. 3000# p.s.i. 7' 6" x 18' platens; 2—58" x 13' x 2½" extra drilled platens. Together with 300 KW Girdler Hi Frequency 113 ton, Williams-White Single opng: 54" x 22" platens; also extra drilled platens; Together with 16 KW Girdler H.F. 5 opening Becker Von Huellen Hot Plate Plywood Press. ALL IN WORKING CONDITION. PLUSWOOD INDUSTRIES, OSHKOSH, WISCONSIN.

FOR SALE: Westinghouse Industrial Radio Frequency Generator, 30 Megacycle, 10 K.W. 220 Volt, 3 phase. In perfect condition. V. L. Smithers Laboratories, Akron, Ohio.

FOR SALE: Carver Hydraulic Lab Press. Ten Ton, with 110 volt Electric hot plates, thermostatic control, extra metal clad thermometer, and pair of 6" x 6" flat steel plates for use on platens. Little used, in owners private lab., in first class condition. Cost $316.00. Price boxed for shipment $250.00 subject prior sale. Reply Box 1245, Modern Plastics.

FOR SALE: 50 ton hydraulic press, Simplex jack and Danley Die Set, 12" square platen, used for laminating plastic. E. B. Thompson, 4600 Highland Ave. Downers Grove, Illinois, telephone D. G. 3391—make offer.

FOR SALE: Complete wood flour mill. Capacity 10 tons per 24 hours, using nearby supply of pine and poplar. For further particulars address Box 1259, Modern Plastics.

FOR SALE: 1 Mkayo Boiler. Max. W.P. 100 lbs. Type S.A.O. 2½ H.P. No. 15136 Manufactured bys Mears & Kane & Ofeldt. 2 Z33DX steel valves, formerly used on Danning & Boschert 169-ton hydraulic molding presses. Contact the W. M. Gullikson Mfg. Co., Newton Lower Falls, Mass.

AT BARGAIN PRICES
Colton 2 and 3 RP Rotary Tablet Machines.
Mikro 18H, 2TH and 4TH Pulverizers; Jay Bee and Schutz O'Neill Mills.
Baker Perkins & Readco Heavy Duty Steam Jacketed, Double Arm 50, 100, 150 gal. Mixers.
Baker Perkins 150 gal. D. A. Unidor Jacketed Mixer.
Baker Perkins 100 gal. D. A. Vacuum Mixers.
J. H. Day 75 & 55 gal. Imperial and Cincinnatus D. A. Jacketed, Sigma Blade Mixers.
Day and Ross Pony Mixers 8, 15 gal. caps.
Hobart & Read Vertical Mixers, from 15 to 120 quart, with removable bowls.
Day & Robinson 100 up to 4000 lbs. Dry Powder Mixers.
Package Machy. FA, FA2, Miller, Hayssen 3-7, Scandia Auto. Cellophane Wrappers.
This is only a partial list. Over 5000 machines in stock—rebuilt and guaranteed—available at tremendous savings.
UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street
New York 12, N.Y.

FOR SALE: One new (in original crate) Westinghouse 2KW High Frequency Oscillating radio generator. Will operate at frequencies of 5, 15 and 30 MC. Excellent for use in the field of induction heating of dielectric materials such as bakelite, plastics, paper, wood, micarta, and rubber. Price ½ of original cost. Injection Molding Company, 3823 Independence Avenue, Kansas City, Missouri.

FOR SALE: Plastic Tumbler Mold, 6 Cavity Injection; Superior Plastics, Inc., 426 N. Oakley Blvd., Chicago 12, Ill.

INJECTION MOLDING MACHINES

1-Oz. Van Dorn, Model H200, new 1947; good condition	Offers
2-Oz. Loominster, semi-auto; 220/V 5 HP good condition	Offers
2-Oz. H.P.M. in good condition; can be seen oper.	3500.
4-Oz. H.P.M. new '39; Model 10-A, good condition	5600.
6-Oz. Reed, W&S 1/42 and up, good condition	6500. up
8-Oz. Reeds, several avail. '42 up; Model 10-D	8000. up
8-Oz. DeMattias (6 avail); 1942 to 1951, good	8500. ea
8-Oz. Loominster, ser. #140 cl; excellent cond.	8500.
8-Oz. Lesters, 1947; good condition, several	11000. up
9-Oz. H.P.M. Mod. 200-8S. serial #22690 class	5950.
12-Oz. DeMattias (4 avail.) serial #9-80 class; 1946	8500. ea
16-Oz. Impco, Reeds, Watson Stillman, HPM, 1946 up	15000. up
22-Oz. Reed, 1946; Model 10-H (2 available)	19500. up
32-Oz. Impco & Reed, good condition, 1949 and up	26000. up
48-80 Oz. Impco injector only, new good cond.	11900.

HYDRAULIC COMPRESSION PRESSES

450 T. H.P.M. new '46, w/ turbo excellent condition	Offers
350 T. Southwark, 18" stroke, 24 x 24 platens	2975.
350 T. H.P.M. new '46; self-contained, good	9500.
275 T. W&S, platens 24 x 55; 8" stroke; 9" daylight	2975.
240 T. Hardinge Platen 24 x 30, 12 stroke	7000.
225 T. W&S angle type; 18 x 18 and 14 x 22	4000.
200 T. Farrel 14 ram, 24 x 24 platens	1750.
200 T. Standard Platens 44 x 44"; 12" ram, rebit; (2)	Offers
170 T. Burroughs Transfer 14" stroke (2 avail.)	1850. ea
75 T. Standard '40 vertical & horizontal	1950.
63 T. Laminating, self-contained, 14 x 22 x 1½"	1450.
50 T. WS & Johnson others available	650. up

MISCELLANEOUS

Vickers Hyd. Pump Model V135 17 gpm new, 15 HP	750.
Phenolic Powder Plant, 200,000 # per mo.	Offers
Huskey #6 Marking Machine, very good condition	950.
Two (2) 16 x 42 Rubber Mills in good condition	Offers
One (1) 16 x 36 Rubber Mills in good condition	Offers
National Extruder, 2½", good condition	6500.
Hartig #500 class, 3½", good condition	3450.
Royal #5 Strainer, 3/60/220-440, good condition	Offers
Farrel Two Roll Mill, 16" x 42, Side type adjust.	3975.
Farrel 16" x 40, Horizontal 3 roll, good condition	5625.
Farrel 14" x 30", endcap rubber mill; good condition	3950.
Farrel 16" x 40", endcap rubber mill; good condition	3125.
Wilson Snyder Pump, 3200#; 40 HP; Triplex Plunger	4000.
Federal . . . Megatherm Induc. Tablet Curing Machines; 3KW/3/60/220 ..	Offers
Grunder Hammer Mill type plastic Grinder; 10HP	1200.

EVERREADY SUPPLY E. J. McCallum, Jr. 805 Housatonic Ave. 4-9471 Bridgeport, Conn.

(*Continued on p. 202*)

a new compound for molding

Rx

Watson-Standard VINYL PLASTISOLS

VINYL PLASTISOL is rapidly becoming known as one of the most versatile tools of the Plastic Industry. It is used both as a coating and as a molding material. The versatility of vinyl plastisol is proved by a range of uses extending from coatings on wire and wire formed objects, for cloth, glove and metal furniture coatings to molded pieces such as doll parts, dolls, play balls, mannequins, atomizer bulbs, and many others.

Many new uses for plastisols are developed each day. The Watson-Standard laboratories have contributed extensively to this progress by their wide experience in formulating compounds for specific end uses. We want to work with you on your problem, whether it be coating or molding. Please contact us for information with regards to your particular needs.

• *Write for your copies of our Technical Papers "Vinyl Organosol and Plastisol Dispersions" and "Slush Mouldings"*

Watson-Standard CO.

225 GALVESTON AVE., PITTSBURGH 30, PA.

NEW YORK OFFICE: 15 Park Row, New York 7, N. Y. • CHICAGO OFFICE: 55 E. Washington St., Chicago 2, Ill.

PLASTICS • INDUSTRIAL FINISHES • CHEMICALS

CLASSIFIED ADVERTISING

(Continued from p. 200)

MACHINERY and EQUIPMENT WANTED

WANTED: electrically heated extruders—any size up to 6". Give full details as to maker, year of make, size, condition, type of worm, type and horsepower of drive, etc. Also where and when equipment may be inspected. Reply Box 1236, Modern Plastics.

WANTED: 2 oz. or 3 oz. injection machine with controls. Late model. Contact Mr. E. Kiss. Philadelphia Plastics & Manufacturing Co., 438 Sedgley Ave., Phila. 40, Pa.

WANTED: Four oz. injection molding machine, second hand, good condition, wanted by New York concern. Write details to Box 1241, Modern Plastics.

MATERIALS FOR SALE

BUY—BARTER—SELL: Phenol—Phthalic—Maleic—Glycols—Titaniums—Zinc Oxides—Hydrosulfite — Bichromates — Ethanolamines — Pine Oil—Benzol—Dyes—Colors, etc. CHEMICAL SERVICE CORP., 90-04 Beaver St., New York 5, N.Y.

FOR SALE: Plexiglas Cement 1-A-.30/lb. in original 4 lb. cans: .25/lb. in case lots 12 cans. 20,000 lbs. Bakelite 2?15401-fibre-drums-.19/lb. subject prior sale F.O.B. Chemical Commodities, Inc. 320 Ridge Bldg., Kansas City, Missouri.

FOR SALE: 3,000 lbs. of clear reground plexiglas or colored to your specification. Plexiglas molding powder virgin—250 lbs. clear Rohm-Haas Formula R-Color 100. Assorted ton lots of Vinyl scrap cuttings; clear and colored-flexible type. Ton lot of vinyl chloride rejects.—Plastisol type. Offered at a price to direct user. Reply Box 1247, Modern Plastics.

FOR SALE: ¼" and 3/16" Dia. Extruded Acetate Rod. Shell Color Virgin material. ¼" Dia. Approx. 700 Lbs., 3/16" Dia. Approx. 300 Lbs. 50 Lbs. or less C.75 per Lb. Special price to anyone interested in the entire lot. Price F.O.B. Bklyn. SABINA PLASTICS CO. 237 Troy Avenue, Brooklyn, N.Y.

MATERIALS WANTED

WANTED: PLASTIC Scrap or Rejects in any form. Acetate Butyrate, Polystyrene, Acrylic, Vinyl Polyethylene, etc. Also wanted surplus lots of phenolic and urea molding materials. Custom grinding, magnetizing and compounding. Reply Box 1228, Modern Plastics.

WANTED: PLASTIC SCRAP or REJECTS in any form: Cellulose Acetate, Butyrate, Polyethylene, Polystyrene, Vinyl, Acrylic and Ethyl Cellulose. Reply Box 1229, Modern Plastics.

WANTED: Plastic Scrap, Rigid Vinyl, Cellulose Acetate, Polystyrene, Polyethylene, Butyrate, Custom grinding, magnetizing, compounding, and straining of contaminated plastics. Franklin Joffrey Corporation, 1671 McDonald Avenue, Brooklyn, N. Y. ES 5-7943.

WANTED: Plastic scrap, rejects, and surplus molding compounds, such as Cellulose Acetate, Vinyls, Acrylic, Ethyl Cellulose, Polystyrene, Butyrate, etc. Also custom grinding, cleaning, and reprocessing of your own plastic scrap. Reply Claude P. Bamberger, Inc., 228 Wooster St., New York 12, N. Y. Tel: SPring 7-0933.

WANTED: Rigid Vinyl scrap in any form. Will purchase on contract basis if desirable as we are steady users. Reply Box 1254, Modern Plastics.

HELP WANTED

PRODUCTION ENGINEER WANTED: By old, established, Massachusetts manufacturer in excellent living small town, trained engineer experienced in handling all phases of production in processing thermoplastics, compounding, extrusion, plastisols, organosols, coated yarns, tapes, tooling, familiar with all present equipments and recommend new ones. Complete responsibility plant repair, engineering and production equipments. Send complete resume giving education, experience, references, salary commanded or required in first letter to Box 1233, Modern Plastics.

COATER ENGINEER OR FOREMAN —Excellent opportunity for experienced man to assume responsibility over new department being set up in old, established firm. Experience necessary with organisols and plastisols. Reply, stating all personal qualifications and business experience. All replies confidential. Reply Box 1230, Modern Plastics.

PLASTIC ENGINEER WANTED

Excellent opportunity for experienced man approximately 30 to 40 years old to run Injection Molding plant. Investment possible if desired. Must be able to take full responsibility for production and quality control also be familiar with estimating, die setting, maintainence and supervising. Good equipment. Metropolitan New York Area. Write complete details, include picture. Replies confidential. Box 1231, Modern Plastics.

YOUNG COLLEGE TRAINED ENGINEER, preferably M.E. to handle product development of all thermoplastics with progressive New England Company. Experience in thermoplastics desirable but not essential. Send complete resume giving education, experience and salary commanded or required in first letter to Box 1232, Modern Plastics."

EXPERIENCED PLASTIC ENGINEER, Chemist or Superintendent for Thermosetting Compression Moulding Plant, now running on Clutch Facings and Brake Lining. Friction material experience absolutely necessary. In replying state age, experience, family status and salary expected. Mail Snapshot. Apply by mail: STANDCO BRAKE LINING CO., P.O. Box 93, HOUSTON 1, TEXAS.

GENERAL MANAGER
COMPRESSION MOLDED
PLASTICS

Large midwest manufacturer. Applicant must be thoroughly acquainted with all phases of industry. Background should include practical experience in manufacturing technique, equipment, and sales. Salary. Give full particulars in first reply. Please address all replies to Mr. L. S. Cawrse, Vice-President, Consolidated Iron-Steel Mfg. Co., 1290 E. 53rd St., Cleveland 14, Ohio.

CHEMIST with extensive background in resins to develop barrier and color coatings for packaging. Must have machine application experience. This is a key position in our Development and Research Department. Polyethylene machine coating experience desired. Attractive salary. Midwest location near large city. Reply Box 1238, Modern Plastics.

ESTABLISHED MOLDER located Central New York and specializing in Compression, Transfer and Plunger Molding desires additional representation on commission basis for expanded Custom Division. Individual representatives desired for following territories: Metropolitan New York; New England; Middle Atlantic States; and Ohio. Reply stating experience, lines carried etc. to President, GENERAL PRODUCTS CORP., Union Springs, New York.

INJECTION MOLDING SUPERINTENDENT: Excellent opportunity open with large midwestern molder. We are interested in a man qualified by experience and education to completely supervise molding, maintenance, and employee relations. Engineering graduate preferred. Salary open. We are part of a large organization, with diversified products and rapid growth. Reply Box 1244, Modern Plastics.

WANTED: Graduate engineer with approximately five years experience in testing or application of plastic materials, primarily thermosetting and thermoplastic molding materials and laminates, having a good knowledge of their physical properties. Position in Plastics Laboratory of large New York State manufacturer of precision electro-mechanical devices. Send full details of education and industrial experience. Reply Box 1251, Modern Plastics...

PLASTICS ENGINEER: Must be experienced in the field of extrusion molding to accept a position of a development engineer with a large organization. Write stating complete background and qualifications, salary, etc. All replies will be held in strict confidence. Reply Box 1249, Modern Plastics.

AN UNUSUAL OPPORTUNITY

We are looking for a man who is interested in coming with an old, established, AAA1 rated, firm which has recently expanded into the extrusion of plastics as a separate department of its business.
We are looking for a man who has technical knowledge on extrusion of vinyls and other plastics, but with particular reference to vinyls.
We are looking for a man who also has executive ability and who can handle and coordinate a complete job.
We are making both rigid and flexible extrusions, and have a complete laboratory staff and make our own formulations and do our own compounding.
Sales are made through our national sales force contacting thousands of retailers, wholesalers and other outlets throughout the United States. If you feel you can contribute to our new undertaking, we would appreciate hearing from you with full details as to your experience, qualifications and salary requirements. All replies will be kept confidential. Reply Box 1250, Modern Plastics.

PRODUCT SALES MANAGER to expand sales of well known line of plastic laminates for industrial applications, also create new markets and products. Excellent opportunity for man 25 to 40 with industrial selling experience. Technical background desired, preferably with college degree. Give complete background and personal qualifications in confidence. Continental Can Company, Inc., Plastics Division, Cambridge, Ohio.

SALES TRAINEE, preferably with recent engineering degree. Leading company offers splendid future in growing plastics field to man 20-25. Imagination, sales ability and willingness to train for two years essential. Interesting first job leads to position as sales engineer. Give complete qualifications in confidence. Continental Can Company, Inc., Plastics Division, Cambridge, Ohio.

INDUSTRIAL SALES ENGINEERS WANTED to sell quality compression and injection custom-molded plastics to industrial customers in assigned territory. Good future for man 25-45 with direct industrial selling experience, particularly in creative selling. Give complete background, personal qualifications, territory preference if any. Your reply will be held in confidence. Continental Can Company, Inc., Plastics Division, Cambridge, Ohio.

DOORWAY INTO PLASTICS

The man we want may already be in the plastics field and looking for a better opportunity —or he may be seeking to enter this field. Probably between 30 and 35 years of age, he has a scientific background—not necessarily a degree but a good foundation in science or engineering. Knowledge of chemistry or chemical engineering desirable, but not a "must." "Musts" include: (1) a sales personality—he likes to meet people and win them to his way of thinking; (2) ambition that will spur him to extraordinary effort; (3) the patience, persistence and confidence to override the delays and setbacks inevitable in sales development work. For this man the doorway is open to a career in plastics with a leading manufacturer of raw materials—a well established, fast growing company whose past record promises well for the future of its employees. Your letter, which should give full details of education and business or professional experience, will be acknowledged and treated in confidence. Reply Box 1252, Modern Plastics.

Plastic mold designer wanted—familiar with all phases of injection molding, capable of engineering and designing products and molds, estimating production and mold cost for a large manufacturing company. When replying, please state all qualifications, stating age, experience and education. Reply Box 1255, Modern Plastics.

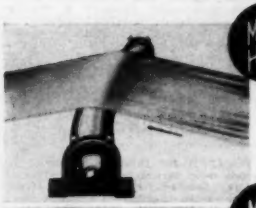
(Continued on p. 204)

All classified advertisements payable in advance of publication

Up to 60 words . $ 7.50	Up to 120 words $15.00	Up to 180 words $22.50
Up to 60 words (boxed) $15.00	Up to 120 words (boxed) $30.00	Up to 180 words (boxed) $45.00

For further information address Classified Advertising Department, Modern Plastics, 575 Madison Ave., New York 22, N.Y.

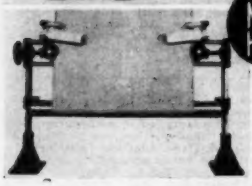
CONTROLLED FEEDING
FATTENS YOUR PROFITS!



Mount Hope

FREE WHEELING EXPANDER

Removes wrinkles and creases before entering next machine. Holds to full width all tire-cord, paper, rubber and plastic films and all types of fabrics.



Mount Hope

PRECISION GUIDER

Positive but gentle control—fully automatic. Maintains accurate lateral alignment on all types of material from heavy sheeting to delicate films.

Other Mount Hope Film and Sheet Handling Devices

1. Mount Hope Open Width Tension Device . . . controls tension.
2. Mount Hope Skewed Weft Straightener . . . sets weft at right angles to warp.
3. Mount Hope Bowed Weft Straightener . . . takes the curve out of bowed filling.
4. Mount Hope Continuous Roll Feed . . . permits sewing on fresh roll at full machine speed.
5. Mount Hope Plaiter . . . ball bearings—neoprene covered draw rolls.

DEPT. M

MOUNT HOPE MACHINERY COMPANY

15 FIFTH STREET, TAUNTON, MASSACHUSETTS

NEW *High Speed* MIXER

- Reduces Pre-Mixing Time
- Provides Complete, Uniform Dispersion of Plastics Ingredients
- Improves Color Blending

The "ENTOLETER" Mixer provides the simplest, most economical method of producing a homogeneous mix. It is easy to install and operate. Requires only 12 cubic feet of space; yet can produce a finished mix at rates up to 200 lbs. a minute. It is adaptable to either batch or continuous mixing. Entoleter Division, The Safety Car Heating & Lighting Co., Inc., 1195 Dixwell Ave., New Haven 4, Conn.

Send for bulletin and reprint describing results on plastics applications.

ENTOLETER
CENTRIFUGAL MACHINES

Why pay more for colored resins, when it's so easy to color them yourself?

No expensive equipment is needed—no special training. All you do is standardize on Ferro dry colorants and the job is easy.

Select the color and exact shade you want and add it directly during your mixing process. Dispersion is quick, no streaking or bleeding, and no dust or contamination of other materials you may be running. In minutes, you've got a stable mix completely ready for forming.

And look at the savings! You pay less for the uncolored resins. You color mix only the minimum amount needed. No scrap or waste. Equipment cleans easily. And you get production-proved results that will keep you sold on Ferro dry colorants.

A trial in your plant is your best proof. Write today for samples and your choice of these simple but helpful folders.

- A The Technique of Coloring Polystyrene.
- B The Technique of Coloring Polyethylene.
- C The Technique of Coloring Polyesters.
- D The Technique of Coloring Plastisols & Organosols.
- E The Technique of Coloring Cellulose Acetate and Cellulose Acetate Butyrate.

FERRO ENAMEL CORPORATION
4150 EAST 56th STREET • CLEVELAND 5, OHIO

Please send free test sample of _____ (color) for _____ (name of plastic)
and the following booklets: A ☐ B ☐ C ☐ D ☐ E ☐

Name _____
Company _____
Street _____
City _____ Zone _____ State _____

CLASSIFIED ADVERTISING

(*Continued from p. 202*)

Plastic mold designer wanted, with thorough knowledge of tool shops located in the east and middle west, to purchase and expedite delivery on a continuous, large, mold-building program. When replying, please state all qualifications, giving age, experience and education. Reply Box 1256, Modern Plastics.

We require the services of an experienced plastic purchasing man who has a good knowledge of continuous sources for secondary and reground plastic materials. Send personal data and background summary to Box 1237, Modern Plastics.

Man experienced in molding and assembling plastic parts. Capable of setting up new plastic plant and training help. When replying, please state all qualifications, giving age, experience, and education. Reply Box 1258, Modern Plastics.

SITUATION WANTED

PRODUCTION FOREMAN, age 37, with 11 years experience in the complete compounding and processing of all types of vinyl film, sheeting, elastomeric and rigid compounds. Experience includes color matching. Quality Control, complete processing and shipping and receiving. At present with a foremost manufacturer. Desire a better opportunity for advancement. Will locate anywhere, Best references. Reply Box 1234, Modern Plastics.

PLASTIC INJECTION MOLDING PLANT MANAGER: Intelligent Hard worker, aggressive, 8 years injection molding experience, throughly reliable, married, age 29, desires position as supervisor or manager of small plant. Fully familiar all phases of plant operation, set-up and maintenance of machines, molds, organizing personnel, etc. Presently in charge of injection olding department but seeking better opportunity New York area. Best references. Reply Box 1261, Modern Plastics.

Position wanted with progressive Company by Plastics Engineer with 8 years experience in compression and injection field. Will Relocate anywhere. Reply Box 1237, Modern Plastics.

Available—Production Manager or Plant Superintendent with considerable practical experience in the calendering of Vinyl film and Vinyl sheeting. Reply Box 1242, Modern Plastics.

PLANT MANAGER or SUPERINTENDENT with 21 years of Supervisory and Management experience. Compression, transfer, injection and cold molded. Ch.E. degree. Qualified Plastics Engineer experienced in plastic material applications. Thorough knowledge of personnel problems, estimating, mold design, molding and finishing operations, production and control systems, sales practices, etc. Desire greater opportunity. Invite investigation. References. Reply Box 1239, Modern Plastics.

Plastic Foreman and supervisor, 14 years experience in compression and transfer molding of small and large parts. Fully familiar with all phases of plant operation, set up and maintenance of machines, mold, preform machine oct. Also Quality, production, inventory and raw material controls. Competent to take full charge of operation. 39 years of age and married. Reply Box 1240, Modern Plastics.

CHEMICAL ENGINEER, 3½ years experience in the organic protective coatings and plastic fields. 25 years old, married, veteran. Cum laude graduate, member of Tau Beta Pi. Extensive color matching and development work with synthetic resins, pigments, dyes, organic solvents, lacquers, and thermoplastics. Production planning and supervision, purchasing, technical service, and quality control. Reply Box 1243, Modern Plastics.

PLASTICS ENGINEER: Graduate Chemical Engineer presently earning Industrial Engineering degree through evening school study desires position with responsibility in plastics field. Four years diversified experience in custom molding, technical service, materials, cost estimating, and mold design. Age 26. Desire position offering experience in production management or industrial engineering. Preference for Chicago area. Reply Box 1246, Modern Plastics.

PLASTICS ENGINEER, age 30, B.Ch.E. Eight years experience in thermoplastics, principally extrusion, films & compounding, chemical & mechanical problems. Polystyrene, polyethylene (both flat and tabular film), cellulosics, & acetals. Plant supervision, research & development, equipment design, excellent technical report writing. Now employed. Seeks permanent connection with better opportunities. Will consider good opportunities in related fields. Family. Will relocate. Reply Box 1248, Modern Plastics.

MISCELLANEOUS

MOLD WANTED for injection molding. We will buy one mold or a complete line or series of molds for finished resalable items. Housewares, toys, novelties, etc. Will also buy molds for industrial parts such as handles, knobs, drawer pulls, gears. All items for resale in U. S. A. Send detailed information to Victory Manufacturing Company, 1722 W. Arcade Place, Chicago 12, Illinois.

Attractive Plastic Items for large production at low cost. New plastic compact, mirror always clear of powder, cover with mirror takes automatically tilted position, no powder leakage; also One Hand Lipstick Container, operated with one hand, automatic action. Both items covered by U.S.A. Canadian, British Patents. Reply Box 1235, Modern Plastics. Outright sale or royalty.

Manufacturers Representatives wanted in major centers except N. Y. Simulated gold and silver metalizing service for plastics, etc. Contacts in cosmetic and general mass plastic field, can effect substantial commission earnings. Protected territory and rapid service on sampling provided. Details please—lines carried, industry serviced and territory covered. Reply Box 1232. Modern Plastics.

For Sale: Eight injection molds for manufacture of eleven different women's and children's handbag frames. If interested write for samples. Best offer takes lot. Reply Box 1260, Modern Plastics.

New . . Model No. 2D-4

PREIS-PANTO ENGRAVER

Pantograph reductions 1:1 (full size) to infinity. A medium sized machine that will do small or large work.

- Engraves to center of 30" wide panel.
- Six spindle speeds from 5000 to 14000 r.p.m.
- At 2:1 ratio, cutter will engrave within 6½" diameter circle.
- At 2:1 ratio, cutter will engrave 1½"x 17" long rectangle.
- Precision ball bearing equipped throughout.
- Perfect for all two-dimensional engraving on plastic molds, steel lettering dies, plastic signs, name plates, dials, panels, etc.

PANTO

Write for complete details, prices and delivery.

H. P. PREIS ENGRAVING MACHINE CO.

853 Route 29 Hillside, N. J.

S.S.WHITE

Elastoplastic

PLUGS *and* CAPS

Slipped into or over the ends of plain tubing, these plugs and caps protect the ends and keep out dirt and moisture.

Made of flexible Vinylite plastic, they are resistant to most oils, offer high electrical insulation, and are easily applied and stay put. For details,

WRITE FOR BULLETIN P-5107

THE S.S.White DENTAL MFG. CO. PLASTICS DIVISION

Dept. M, 10 East 40th St. NEW YORK 16, N. Y.

WESTERN DISTRICT OFFICE: Times Bldg., Long Beach, Calif.

QUALITY
Glidden
PRODUCTS

A Great Story Unfolds!

Currently, the great story of Glidden leadership in PLANNED RESEARCH is appearing in many of the nation's most influential publications.† The Chemical and Pigment Company Division is proud of the contributions its three laboratories, in cooperation with the 23 other laboratories of the Glidden family, have made to bring about this leadership. It is further assurance to every user of pigments that every Glidden pigment is the finest and most advanced of its kind available in the world.

†*Collier's, Fortune, Time, Newsweek, Business Week, U.S. News, Wall St. Journal.*

THE GLIDDEN FAMILY OF QUALITY PIGMENTS

CADMOLITH* COLORS

... each one a leader in its field!

Government Order NPA-M 19 restricts the use of pigments made from cadmium metal in the present emergency. Cadmolith Reds and Yellows, which offer a combination of advantages found in no other red and yellow pigments, are in limited production at this time. Samples gladly furnished on request.

SUNOLITH* LITHOPONE

A superior pigment for flat wall paints, undercoaters, water base paints, rubber and many allied products.

ZOPAQUE* TITANIUM DIOXIDE

A pure titanium dioxide offering excellent color and hiding power plus unexcelled working properties.

*Trade Mark Registered.

INDEX OF ADVERTISERS

NOVEMBER 1951

Accurate Molding Corp. 154
Acheson Colloids Corp. 129
Aeromark Company, The 163
Adamson United Company 63
Aldrich Pump Co., The 38
Allied Chemical & Dye Corp., The Barrett Div. 151
American Agile Corporation 122
American Anode Inc. 20
American Cyanamid Company, Plastics Department 102, 103
American Insulator Corp. 72
American Molding Powder & Chemical Corp. 59
American Wheelabrator & Equipment Corp. 139
Amplex Manufacturing Co. 122
Anderson Bros. Mfg. Co. 140
Atlas Valve Company 132
Auburn Button Works, Inc. 136
Avery Adhesive Label Corp. 209

B.I.P. Tools Limited 51
Bailey, R. N., & Co., Inc. 174
Bakelite Company, A Division of Union Carbide & Carbon Corp. Inside Back Cover
Baker Brothers, Inc. 143
Ball & Jewell, Inc. 55
Bamberger, A., Corporation ... 58
Barker-Davis Machine Co., Inc. . 171
Barrett Div., The Allied Chemical & Dye Corp. 151
Black-Clawson Co., The, Dilts machine Works 126
Boonton Molding Co. 22
Borden Company, The, Chemical Division 49
Bridgeport Moulded Products, Inc. 19
Brown Company 132
Buttondex Corp. 134

Cabot, Godfrey L., Inc. 133
Cambridge Instrument Co., Inc. . 171
Carver, Fred S., Inc. 191
Catalin Corp. of America 1
Cavagnaro, John J. 138
Celanese Corp. of America, Plastics Division 9
Chicago Molded Products Corp. . 4
Ciba Company, Inc., Plastics Division 169
Claremont Waste Mfg. Company 163
Classified 200, 202, 204
Clopay Corporation 50
Conforming Matrix Corp. 207
Continental Can Co. 152, 153
Continental Screw Co. 175
Crucible Steel Co. of America .. 34
Cruver Manufacturing Co. 28
Cumberland Engineering Co. Inc. 41

Diemolding Corporation 148
Dilts Machine Works, The Black Clawson Co. 126
Dow Chemical Co., The 193
Drakenfeld, B. F., & Co., Inc. .. 138
DuBois Plastics Products, Inc. .. 123
du Pont de Nemours, E. I., & Co. (Inc.,) Electrochemicals Dept. 154
du Pont de Nemours, E. I., & Co. (Inc.,) Polychemicals Dept. .. 7
Durez Plastics & Chemicals, Inc. Inside Front Cover

Eagle Tool & Machine Co. 158
Eastman Kodak Co., Cellulose Products Division 121
Erie Engine & Mfg. Co. 156
Erie Resistor Corp. 195

Fabricon Products, Inc. 182
Farrel-Birmingham Co., Inc. 37
Fellows Gear Shaper Co., The .. 115
Ferro Chemical Corp. 183
Ferro Enamel Corp. 203
Fiberite Corporation 158
Flexfirm Products 67
Flightex Fabrics, Inc. 157
Flintkote Company, The 70
Formica Company, The ... 166, 167
French Oil Mill Machinery Co., The 149

Geissel Mfg. Co., Inc. 157
General American Transportation Corp. 56, 57
General Electric Co. .... Back Cover
General Industries Co., The 186, 187
Gering Products, Inc. 149, 156, 191
Glass Fibers Inc. 40
Glidden Co., The 205
Goodrich, B. F., Chemical Co., The 3
Goodyear Tire & Rubber Co., The 23, 35

H & R Industries 163
Hardesty Chemical Co., Inc. 171
Hercules Powder Co. 29
Heyden Chemical Corp. 197
Hinde & Dauch Paper Co., The . 123
Hobbs Mfg. Co. 149
Hooker Electrochemical Co. 47
Hydraulic Press Mfg. Co., The .. 21
Hy-Pro Tool Co. 155

Iddon Bros. Ltd. 32
Ideal Plastics Corp. 147
Improved Paper Machinery Corp. 132
Industrial Heater Co., Inc. 129
Industrial Manufacturing Corp.. 142
Industrial Research Laboratories, Ltd. 146
International Textile Company .. 182

Jackson & Church Co. 26, 27
Jeffrey, Franklin, Corp. 127

Kentucky Color & Chemical Co., Inc. 159
Kingsley Stamping Machine Co. 164
Koppers Co., Inc. 39
Kurz-Kasch, Inc. 17

Lane, J. H., & Co., Inc. 127
Lembo Machine Works, Inc. 207
Lester-Phoenix, Inc. 66
Lewis Machine Co. 207
Lewis Welding & Engineering Corp., The 8
Libbey - Owens - Ford Glass Co., Plaskon Div. 99

Manco Products Co. 123
Manufacturers, Literature . 177, 178
Marblette Corp. 108
Mayflower Electronic Devices .. 185
Mearl Corp., The 162
Metaplast Process, Inc. 135
Metasap Chemical Co. 12
Meyercord Co., The 159
Michigan Chrome & Chemical Co. 136
Michigan Molded Plastics, Inc. .. 172
Mid-America Plastics, Inc. 18
Midland Die & Engraving Co. .. 96
Mills, Elmer E., Corp. 53
Minnesota Plastics Corp. 36
Mitts & Merrill 159
Modern Plastic Machinery Corp. 13
Molded Products Corp. 54
Molded Resin Fiber Co. 176
Monsanto Chemical Co., Organic Chemicals Div. 45
Monsanto Chemical Co., Plastics Division 189
Mosinee Paper Mills Co. 111
Moslo Machinery Co. 18
Mount Hope Machinery Co. 203
Muehlstein, H., & Co., Inc. 199

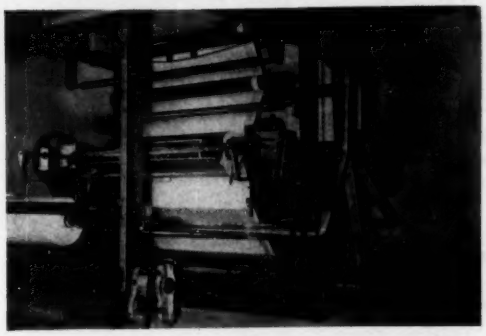
National Lead Company 30
National Rubber Machinery Co. . 48
Naugatuck Chemical 113, 161
New England Lacquer Co. 126
New Hermes, Inc. 137

(Continued on Page 208)

FOUR COLOR LEMBO

printing machine for vinyl and polyethylene films

- **Handwheel or motor controlled register units assuring accurate register at all speeds**
- **no exposed gearing**
- **Repeats in patterns from 14" to 72" and larger upon request**



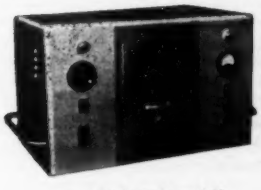
Write for our new illustrated brochure

LEMBO ***machine works, inc.***

248 East 17th St. Paterson 4, N. J.

Manufacturers of Printing Presses and Cylinders

Dielectric Pre-Form Heater Allows Continuous Operation at Maximum Output



A twin model available as an induction heater

A 1500 watt dielectric heater built *up to a standard*, not down to a price. Raises temperature of 1½ lbs. of plastic, other average materials, 170 degrees in one minute. High quality components and construction prevent expensive breakdowns, allow continuous operation.

LEWIS

This machine now available in various sizes. Write for more information.

LEWIS MACHINE COMPANY

890 NEWCOMB STREET • ST. PAUL 6, MINNESOTA

by rapidly wet painting three-dimensional parts, one color after another, through the use of our accurate, snug-fitting

ELECTRO-FORMED METAL MASKS

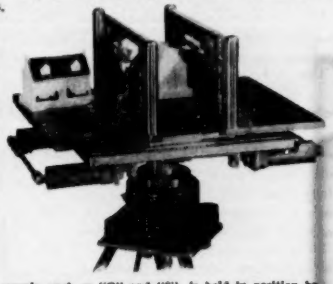
(MADE BY PATENTED PROCESS)

and foot treadle

AIR-OPERATED FIXTURES

which position and hold the piece snugly in the mask, maintain the desired pressure, and permit the operator to use both hands.

Plug-type masks for keeping depressed areas clear, while spraying background; lip-type masks for protecting the background while painting depressed areas; and block cutout plane surface type masks. Clean, sharply, defined letters and decorative effects are obtained on intricate die castings, stampings and plastic forms by accurate control of painted areas with no fogged edges. After-wiping or buffing off of overspray is unnecessary. The "loose" inside of letters and numerals, such as "O" and "6", is held in position by arched bridging to eliminate objectionable "ties."



We also design, engineer and build

COMPLETE AUTOMATIC SPRAY EQUIPMENT

(WITH OR WITHOUT MASKS)

MASK WASHING EQUIPMENT

AND

AIR-OPERATED CLAMPS, FIXTURES AND TOOLS for

positioning parts in masks while painting or holding parts in place for other operations, such as welding.

Automatic, entirely air-operated machines for spray decorating a variety of small plastic and metal parts—one color after another—at speeds of up to 3600 per hour.

Eliminates the hazards of electric motors, mercury or solenoid switches and the cost of explosion-proof electrical equipment.

Masks are inserted so as to be flush with top of the working table. Spraying is from below. Frequency of mask cleaning greatly reduced. Dial regulates the cycling speed. Using a conveyor belt, operator can use both hands to load.

Another dial regulates the amount of paint sprayed. At any given setting, the same amount of paint is sprayed on every part, regardless of the speed of the loading cycle. Effects paint savings of up to 50 percent over hand spraying.

Employs 8 latest automatic guns and two 2-gallon air-agitated paint pressure tanks with four insert containers.

SEND COUPON NOW!

CONFORMING MATRIX CORPORATION

364 Toledo Factories Building Toledo 2, Ohio

Please send, without obligation, details on ( ) Hand masks; ( ) Mechanical masking fixtures; ( ) Air-operated masking fixtures; ( ) Stationary automatic spray painting masking machines; ( ) Rotary table automatic spray painting masking machines; ( ) Quotation on masks for parts (or prints) which I am forwarding.

Name .....

Firm .....

Street .....

City & State .....

INDEX OF ADVERTISERS
(Continued from Page 206)

Newark Die Company 33
Nixon Nitration Works 16
Nordan Plastics Corp. 140
Northern Industrial Chemical Co. 156
Norton Laboratories, Inc. 61

Orange Products, Inc. 142

Parker-Kalon Corp. 44
Parker Stamp Works, Inc., The .. 168
Peter Partition Corp. 135
Pittsburgh Coke & Chemical Co. 10
Plaskon Division, Libbey-Owens-Ford Glass Co. 99
Plastic Molding Corp. 170
Plastics Engineering Co. 42
Preis, H. P., Engraving Machine Co. 204
Progressive Machine Co., Inc. ... 146
Projectile & Engineering Co. Ltd., The 68

Quinn-Berry Corp. 24

Reed-Prentice Corp. 11
Reichhold Chemicals, Inc. 131
Richardson Co., The 6
Rogers Corporation 52
Rohm & Haas Company, Plastics Division 69
Rohm & Haas Company, Resinous Products Division 119
Royle, John & Sons 134

Safety Car Heating & Lighting Co., Inc 203
Santay Corporation 125
Schulman, A., Inc. 136
Schwartz Chemical Co., Inc. 134
Scranton Plastic Laminating Corp. 148
Shaw, Francis & Co., Ltd. 64
Silleocks-Miller Co., The 185
Sinko Mfg. & Tool Co. 138
Smart & Brown Ltd. 46
Standard Electric, Mfg. Co., Inc. . 164
Standard Tool Co. 162
Stanley Chemical Co. 179
Sterling Electric Motors 128
Stokes, F. J., Machine Co. 43
Stricker-Brunhuber Corp. 126
Styrene Products Ltd. 25
Synthane Corp. 65

Tennessee Eastman Co. 117
Thermel, Inc. 174
Thermo Electric Co., Inc. 154
Timken Roller Bearing Co., The .. 31
Titanium Pigment Corp. 60
Tracerlab Inc. 140
Tumb-L-Matic, Inc. 184
Tupper Corporation 62

Union Carbide & Carbon Corp., Bakelite Company
Inside Back Cover
United States Gasket Company .. 124

Van Dorn Iron Works Co., The . 145
Victory Manufacturing Company 199

Waterbury Companies, Inc. 160
Watlow Electric Mfg. Co. 165
Watson-Standard Co. 201
Watson-Stillman Co., The .. 14, 15
Westchester Plastics, Inc. 141
Western Felt Works 142
White, S. S., Dental Mfg. Co. ... 204
Windsor, R. H., Ltd. 71
Woloch, George, Company 165
Worcester Moulded Plastics Co. . 210
Wood, R. D., Co. 185

Zenith Plastics Co. 173

MODERN PLASTICS

575 MADISON AVENUE • NEW YORK 22, N.Y.

"Please recommend a material which will . . ."

"Our need is a plastic wheel that . . ."

"Do you know of a manufacturer who . . . ?"

". . . and how can we insulate it?"

"Who makes stock molded cookie cutters?"

"Where can I purchase a machine that . . . ?"

Each month, the Readers' Service Department of MODERN PLASTICS answers scores of questions for our readers. Questions range from simple requests for information about the manufacturer of a stock molded item to requests which demand detailed, technical answers.

With their extensive files, reference library and wide knowledge of plastics materials, machinery and procedures, the members of the Readers' Service Department can usually supply the information you request. In addition, the technical and editorial staffs of MODERN PLASTICS are at their disposal for attending to questions which are particular "sticklers." If you have any questions, feel free to forward them. There is no charge or obligation for this service. Address — Readers' Service Department, MODERN PLASTICS. A complete reply to your inquiry will be sent promptly.

MODERN PLASTICS

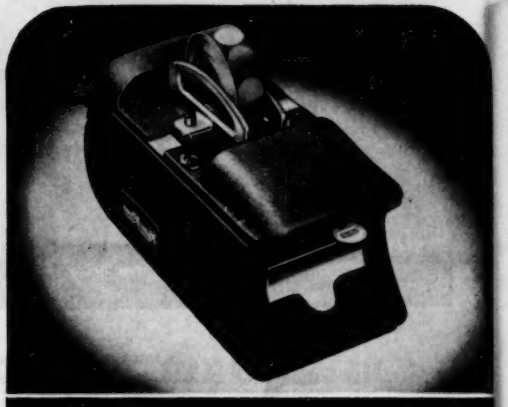
A Breskin Publication

575 Madison Avenue New York 22, N. Y.

informative labeling in action!

No doubt about the advantages of this product, for Kum-Kleen Informative Labels tell and sell the consumer.

No scraping, soaking—no disgruntled customers, for Kum-Kleen Informative Labels peel off without leaving a trace.



No high labeling cost, for Avery Dispensing methods give you Informative Labeling at a fraction of the cost of other methods.

Everyone agrees on the advantages of informative labeling, yet many plastic products remain unlabeled. Budget is usually the factor. However, this problem disappears when you've heard the Kum-Kleen Informative Labeling Story, for the Avery representative can show you the results of dozens of actual cases of plastics fabricators who have found that the combination of Kum-Kleen Pressure-Sensitive Labels plus the Avery Electric Dispenser keeps informative labeling well within their budget.

The advantages are obvious. Kum-Kleen Pressure-Sensitive Labels are *the* labels for plastic because they stick to any plastic surface, will not pop or curl off. The Avery Electric Dispenser is one of the means of providing production line speed and economy without expensive equipment investment.

The product shown above is just one of the many made by Columbus Plastics Products of Columbus, Ohio, who have been leaders in the field of informative labeling, and their choice is the economical combination of Kum-Kleen Labels plus the Electric Dispenser. Better hear the entire Kum-Kleen story.

Write for samples and prices.

Kum-Kleen

AVERY ADHESIVE LABEL CORPORATION

NEW YORK CITY: 117 Liberty Street
DETROIT: 3049 East Grand Boulevard
CLEVELAND: 2123 East 9th Street
PHILADELPHIA: Commercial Trust Building
CHICAGO: 608 South Dearborn Street
CINCINNATI: 626 Broadway Street
MONROVIA: California

Representatives In All Principal Cities

End Your Quest For Quality at

wmp

QUALITY MOULDING

QUALITY DIE DESIGNING

QUALITY ENGINEERING

QUALITY DIE MAKING

QUALITY FINISHING AND INSPECTING

You can well afford to search the market for a custom injection moulder with leadership in moulding facilities and reputation for quality manufacture. Plastically speaking, we put a quality team of die designers, die makers, moulders, finishers and inspectors to work on your product regardless of its size or the quantity of your order. Because we manufacture no product under our own name, they concentrate solely on YOURS.

WMP Custom Mouldings are of Custom Made Quality.

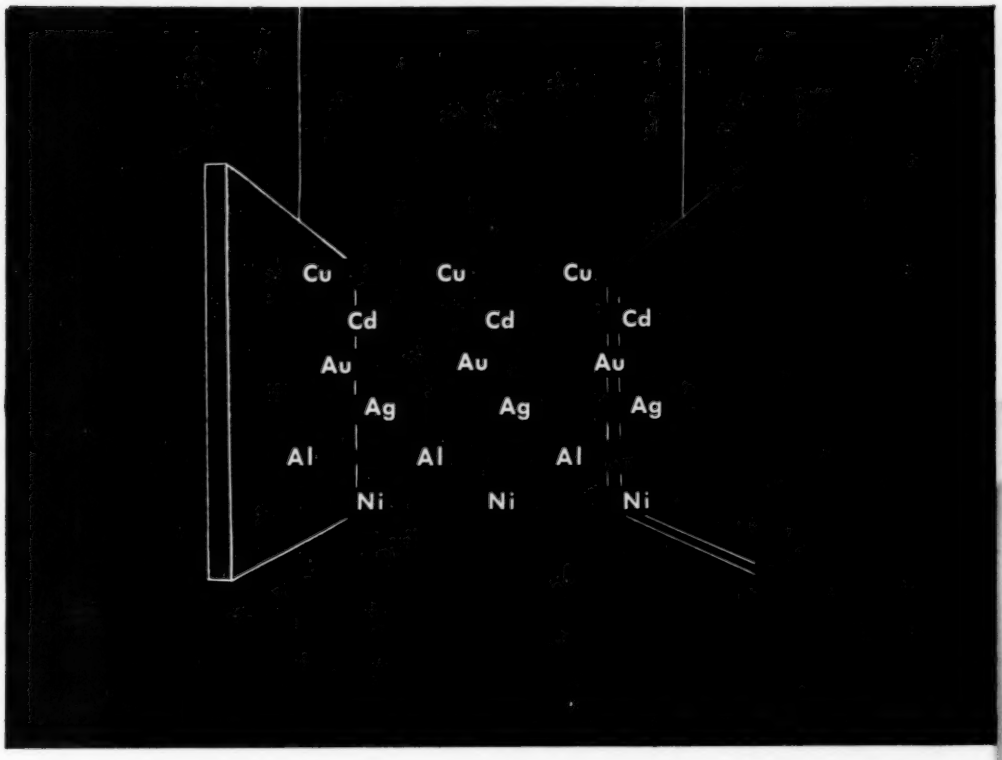
wmp

Custom Injection Moulding

WORCESTER MOULDED PLASTICS CO.

14 HYGEIA STREET, WORCESTER 8, MASS.

17 East 42nd St., New York 17, N. Y.



YOU'RE INVITED TO THIS WEDDING!

The union of plastics and metals is taking another new form today! Both BAKELITE Phenolic and Styrene Plastics are now being electroplated with copper, cadmium, gold, silver, aluminum, nickel, brass, tin, and other metals. Thus, great new strides are made in combining the desirable properties of metals with the equally useful characteristics of plastics—at low cost, and with notable conservation of critical materials.

Since plastics ordinarily do not conduct electricity, a way had to be found to form a conductive coating. The trick is turned by first roughening plastic parts, then dipping them in a chemical sensitizer. This is followed by application of a thin bond coat of silver by means of chemical reduction in solution.

Actual electroplating begins here. On the outside of perforated drums revolving in a special electrolyte, copper anodes furnish ions which migrate through the holes in the drum to the parts tumbling inside in contact with electrodes in the drum base.

Silver, gold, tin, or other metals are firmly and permanently plated on the resulting copper plate. After a final buffing, the high polish and long-wearing smoothness of the metals are advantageously wedded to the lightweight and corrosion resistance of plastics.

An interesting and useful stage of the plastic-plating process permits many variations in the final color of the products.

Many industries are studying the results intently. Perhaps yours will be one to benefit most. Write Dept. CS-13.

Data furnished by Plastiplate Co., Inc., South River, N. J.

BAKELITE
TRADE-MARK
PLASTICS

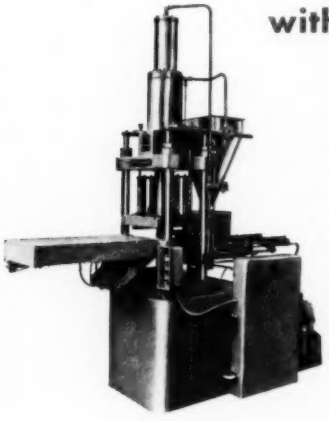
BAKELITE COMPANY
A Division of
Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York 17, N.Y.

Plastics News

MOLDING COMPOUNDS, LAMINATING & INDUSTRIAL RESINS

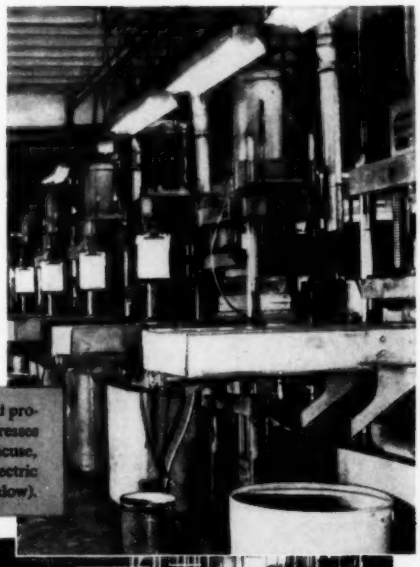
ALKYDS • PHENOLICS • POLYESTERS • RUBBER-PHENOLICS • SILICONES

Get Top Performance from Automatic Equipment with G-E Molding Compounds



F. J. Stokes Machine Co.
741 Automatic Press

General Electric's 12490 (brown) and 12493 (black) general-purpose compounds are proven performers in such modern molding installations as Hugh H. Eby, Inc., Pass & Seymour, Inc., Strauss Engineering Co. and Sylvania Electric Products, Inc. These outstanding materials can help you increase your production and lower your costs.



G-E molding compounds speed production on Stokes automatic presses at Pass & Seymour, Inc., Syracuse, N. Y. (above) and Sylvania Electric Products, Inc., Warren, Pa. (below).

Here's why:

1. **Maximum output**—because of their *fast curing* and *rigid setting* properties
2. **Minimum waste**—because their uniform bulk virtually eliminates the possibility of overloading
3. **Steady production**—because these compounds *pour cleanly* and *evenly*
4. **Few rejects**—because of the easy *flash release* of these compounds

WANT MORE INFORMATION?

Find out more about G-E molding compounds by writing for samples and technical information to Section J-5, Chemical Division, General Electric Co., Pittsfield, Mass.

There's MORE for the MOLDER in General Electric's complete line of thermosetting plastics compounds.

GENERAL ELECTRIC